

CTO

THE MAGAZINE FOR INFORMATION EXECUTIVES

FEBRUARY 1991
VOLUME FOUR NUMBER FIVE
SEVEN DOLLARS

COVER STORY:

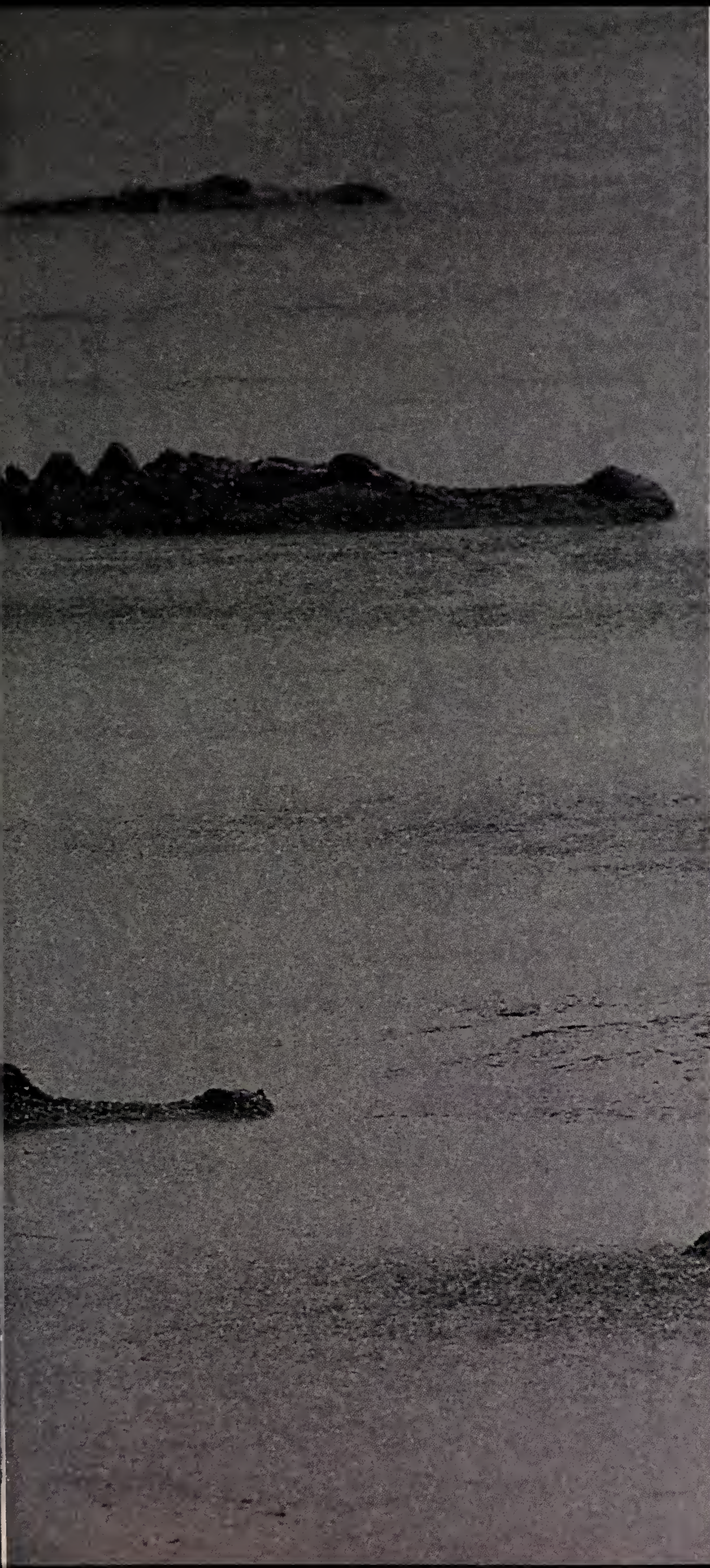
IS Gears Up For a Downhill Economy

Business Units Enlist IS Partners

© Digital Equipment Corporation, 1991. The DIGITAL Logo and DECnet are trademarks of the Digital Equipment Corporation.
AppleTalk is a registered trademark of Apple Computer, Inc.



WE'LL GIVE YOU CONTROL OF
ALL YOUR NETWORKS, AND
YOUR USERS WON'T FEEL A RIPPLE.



All is calm.
The silence is
broken only by
the distant call of
a whippoorwill.
Then, something
stirs the mirrored



surface. Huge jaws thrust open. Razor-sharp teeth flash.

You've just tried to take freedom away from your users.

Now you can gain control of all your different networks, without disrupting your business.

Take Digital's Enterprise Management Architecture (EMA). It gives you a blueprint for tying together your multi-vendor network environments. And our Network Application Support (NAS) integrates applications across these environments. These standards-based approaches to networking let you manage all your networks, anywhere in the world, like a single global network. Including TCP/IP, SNA, DECnet,TM AppleTalk, or virtually anything else you may have.

By removing the barriers created by your earlier network decisions, Digital protects your current investments, while giving you unlimited options to change or expand your network in the future.

That way, you have the power to control all your networks, and your users can continue doing business as if nothing had ever changed.

Central Control. Local Freedom. From Digital. Because what your users don't know can't hurt you.

For more information, call 1-800-343-4040, ext. 626. Or contact your local Digital sales office.

digitalTM

“To get SQL, they said I’d have to walk away from 20 years, millions of dollars and start all over again.

I told them to

go fish

and today, I have navigational and relational technology together, in a single database. They said I couldn’t do it, but who listens to them anyhow?”

There are many differences between hardware and software companies. The one we’re most proud of at Computer Associates is our faithful commitment to protect your investment.

We always find responsible, practical, economical ways to help you connect your present applications with the breakthroughs of tomorrow. We can give you relational technology while protecting your investment in VSAM, DL/I, IMS and TOTAL. And our revolutionary, new Computing



Architecture for the 90s can free you from hardware dependencies and give you all the application portability and distributed processing you need.

It’s also your insurance policy that you’ll never have to throw applications away again.

To find out more, call 1-800-645-3003. And forget what the hardware companies tell you. They may not be able to do it.

But we can.



CIO

VOLUME 4, NUMBER 5

COVER STORY

Retrenching to Cope with Recession

36

Now that hard times have hit, most CIOs will have to join their fellow executives in cutting budgets. But they may get to do it with a scalpel rather than an ax—and some may even find themselves exempt from the bloodletting.

By David Freedman

*Bad times cross-country 36
Cover photo by Bob Perry*

FEATURES

Stalking the King-Sized System

24

At a time when big IS projects have a lot of people running scared, Citicorp's David Starr has subdued a strategic Goliath.

By Thomas Kiely



*Taming the
big system 24*

A Partner Is Born

50

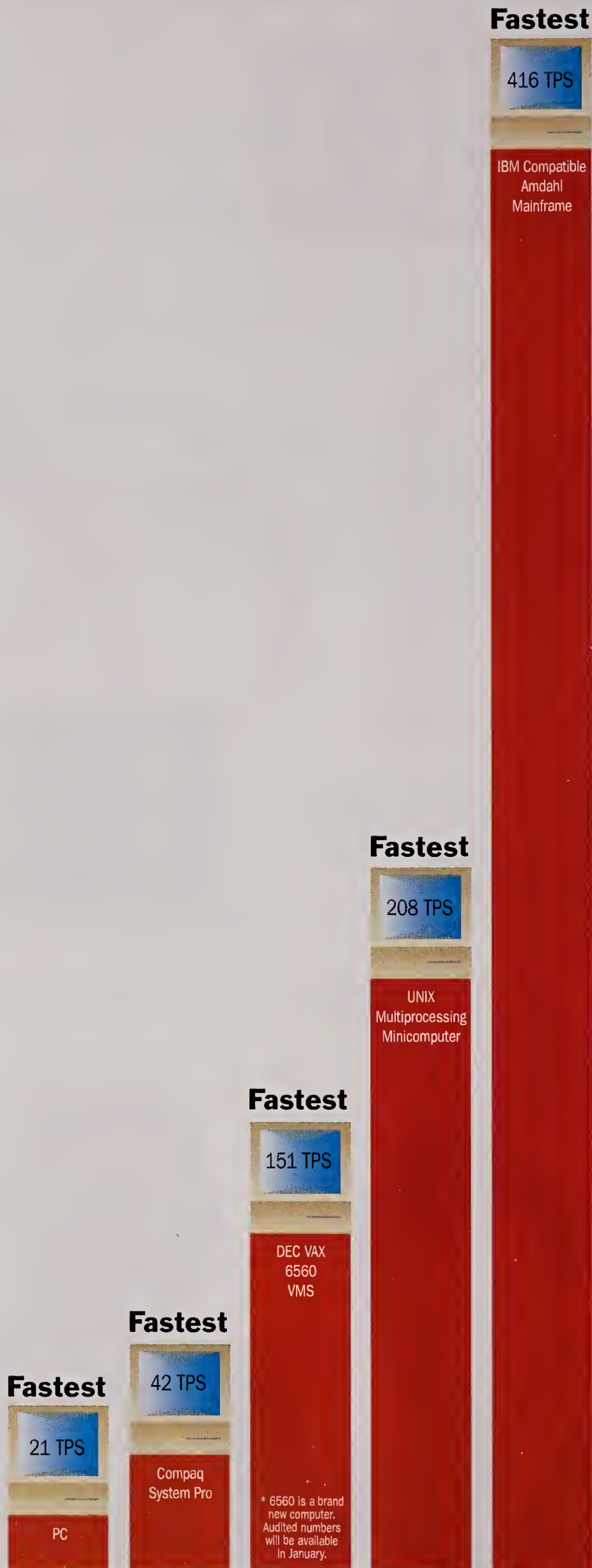
Up from the rubble of Fortress IS comes a new corporate hybrid: the "business analyst," who works as a member of a line department or business unit and illuminates ways of using IT to achieve business goals.

By Paul Konstadt

MORE ►►►

*The new
breed 50*





Oracle sets client/server OLTP performance records.

The new audited ORACLE® benchmarks show transaction-per-second (TPS) scores from 21 TPS with a 200 megabyte database on a PC, to 416 TPS with an 8 gigabyte database on a mainframe.

These were industry-standard TP1 tests independently certified by Codd & Date.*

This scalable performance means ORACLE not only runs on virtually all computer architectures, it runs fastest on all of them. Fastest on a standalone machine. Fastest in a client/server configuration.

So no matter what system you choose, you get the best performance and lowest cost per transaction. No small concern to managers trying to squeeze the most out of MIS/DP budgets.

1-800-633-1059 Ext-9616

But don't just take our word for it. Call, and ask for the benchmarks reports audited by Codd & Date. They certify the test results and give a full account of the testing methodology and system configurations.

Just the thing for a little speed reading.

ORACLE®

Software that runs on all your computers.

FEATURES (cont.)

From Big Bang to Big IT

Arno Penzias won the 1978 Nobel Prize in physics for identifying the remnants of the cataclysm that formed the universe. Now he says that information technology is "where the action is."

By Paul Konstadt

62



IT's Bellwether 62

COLUMNS

INSIGHTS: AN OUNCE OF PREVENTION

The spread of computer viruses has reached epidemic proportions, but early diagnosis, prompt treatment and a little preventive medicine may go a long way toward halting the plague. *By Richard G. Lefkon*

20



Freedom of voice 70

STATE OF THE ART: IN GOOD VOICE

Telephone networks have helped to transcend the spatial restrictions of doing business; now voice-processing technologies are overcoming the temporal constraints as well. *By William W. Creitz*

70

HUMAN FACTORS: PUTTING TRAINING ON TRACK

IS departments that have given training the short shrift can implement new and better programs with a little help from senior management and the latest technology. *By Ely S. Lurin*

76

DEPARTMENTS

Editor's Letter 8

Publisher's Letter 10

Trendlines 12

- ▶ Cruise-line computers
- ▶ Accident appraisals
- ▶ College admissions
- ▶ Salary hikes
- ▶ Consumer outlook
- ▶ Hope for the jobless

- ▶ CIOs in demand
- ▶ Time-sharing advantages
- ▶ On the move
- ▶ Status indicators
- ▶ SIM competition
- ▶ Career moves
- ▶ Speed-reading

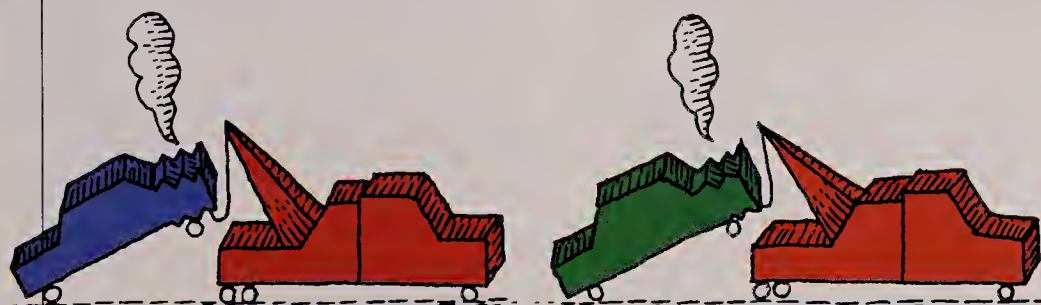
FYI 80

Events/Index 82

Conference Call 84



Inflated titles 12



Damage data 12

The IEF™ can help you develop unprecedented quality, productivity



"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

David V. Evans
Vice President
Director, Information Systems
J.C. Penney



"Our On-line Banking system has been in production for more than 12 months—500,000 transactions a day—without a single code failure. And we had very few enhancements to do. Our users got what they needed the first time out."

Mark Quinlan
Senior Programmer/Analyst
Huntington National Bank



"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

John Pajak
Executive Vice President
Mass Mutual Life Insurance



"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group



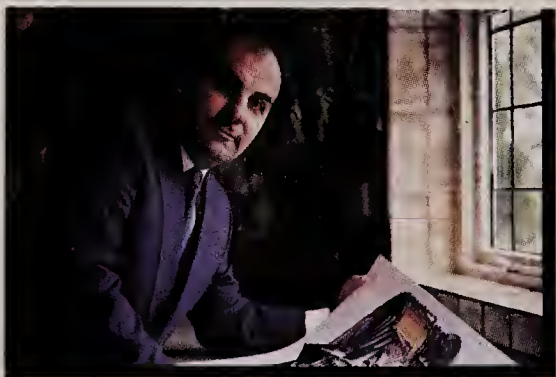
"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services



"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head - MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce



"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA



"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

Top information systems with productivity and maintainability.

The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

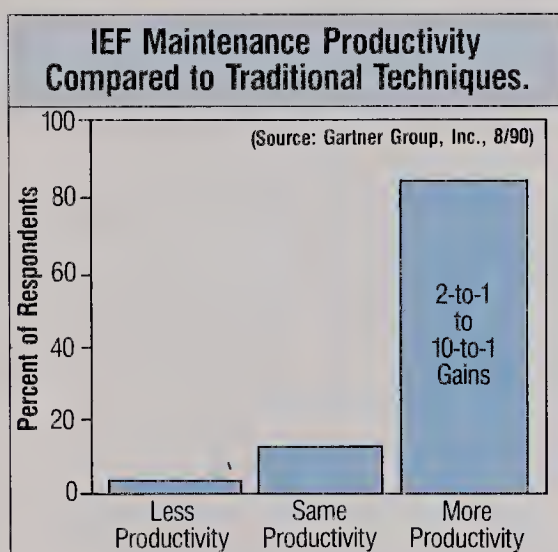
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will

follow. We are committed to increased environmental independence in support of the Open Systems concept.

We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's Cohesion—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.

Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

TEXAS 
INSTRUMENTS



Doing more with less has been the watchword of CIOs for some time now. Recent conversations with information executives reveal that for at least the past year—even before the recession became official—they have been under pressure to find ways to continue to deliver strategic IS solutions for their organizations with far fewer resources, including people.

With the recession now in full bloom and fueled by upheaval in the Middle East, will CIOs be asked to find even more bootstrap ways to meet corporate IS demands? How much will they have to whittle away from already austere resources?

Rather than across-the-board cost cutting, CIOs today are carefully setting IS priorities, reports *CIO* regular contributor David Freedman in our cover story, "Retrenching to Cope with Recession," starting on Page 36. Some CIOs are cutting back the number of projects they are investing in, leaving for another day systems that are not deemed critical. Information executives seem to be in agreement that systems tied to quality improvement or customer service are becoming the sacred cows of IS enclaves. IT chiefs know that information technology that keeps their organizations competitive is an investment that simply cannot be postponed because of tough economic times.

Another strategy being used to help keep the organization competitive is assigning information systems professionals to business units, in effect, making them business analysts. In "A Partner Is Born," beginning on Page 50, Senior Writer Paul Konstadt reports on some of the emerging issues and results of this trend, which is still in its seminal phase. Creating this new business analyst involves deep cultural changes both on the part of the systems person and by business-unit personnel.

Businesspeople want evidence that IT is going to provide increased value to the business unit, and they report having to spend a lot of time educating IT professionals about business issues and prodding them to create flexible systems that respond quickly to the marketplace. As one new business analyst put it, he had to sacrifice "technical elegance" to respond to business-unit demands that are often driven by short-term, bottom-line goals.

Despite this cultural upheaval, a bonding between IS business analysts and their business-unit colleagues is occurring and starting to produce results. One executive described the process as no longer "throwing sets of requirements across the wall, then tossing specifications back."

Marcia Blumenthal



© By CIO Publishing Inc.

Publisher/Editorial Director JOSEPH L. LEVY

Editor-in-Chief MARCIA BLUMENTHAL
Managing Editor LEW MCCREARY
Art and Design Director MARY LESTER MARSHALL
Special Projects Editor ALLAN E. ALTER
Associate Editor ABBIE LUNDBERG
Senior Writer THOMAS KIELY
Senior Writer PAUL KONSTADT
Senior Writer MEGHAN O'LEARY
Copy Editor LEIGH BUCHANAN
Editorial Researcher MEGAN SANTOSUS
Assistant Art Director MOIRA GILLIS
Art Assistant HEIDI GOWEN
Editorial Assistant MINA C. AHN

Vice President/Associate Publisher ROBERT E. BLOCK
General Manager of Executive Programs LYNDA ROSENTHAL
Vice President of Operations LESLIE L. FALKNER
Marketing Services Manager LORI CARDARELLI
Production Manager LORI BETH SADEWITZ
Administration Manager NANCY A. BRYSON
Assistant to the Publisher DIANE MARTIN
Advertising Sales Assistant LISA B. SHIFMAN
Operations Assistant SUSAN WOODWORTH

Contributing Writers William W. Creitz, David Freedman, Richard G. Lefkon, Ely S. Lurin

Contributing Art Directors Susan Yousem, John Sizing

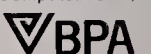
CIO Editorial Advisory Board Ronald T. Brzezinski (Coopers & Lybrand), William L. Harrison (The Hartford), James S. Marston (American President Companies Ltd.), Pat Mullen (Digital Equipment Corp.), John F. Rockart (Center for Information Systems Research), Robert W. Stearns (Codex Corp.), Patricia M. Wallington (Xerox Corp.)

Editorial Offices CIO Publishing Inc., 492 Old Connecticut Path, P.O. Box 9208, Framingham, Mass. 01701-9208
 (508) 872-8200

International Data Group

Board Chairman PATRICK J. MCGOVERN
President WALTER BOYD
Vice Chairman AXEL LEBLOIS
Executive Vice President WILLIAM P. MURPHY

CIO is a publication of International Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Data Group publications each month. International Data Group's publications include: **Argentina's** Computerworld Argentina; **Asia's** Asian Computerworld; **Australia's** Computerworld Australia; **PC World**, Macworld; **Austria's** Computerwelt Oesterreich; **Brazil's** DataNews, PC Mundo; **Canada's** ComputerData; **Chile's** Informatica, Computacion Personal; **Colombia's** Computerworld Colombia; **Denmark's** CAD/CAM World, Computerworld Danmark, PC World, Macworld, Unix World; **Finland's** Mikro PC, Tietoviikko; **France's** Le Monde Informatique, Distributique, InfoPC, Telecoms International; **Hungary's** Computerworld SZT, Mikrovilag; **India's** Computers & Communications; **Israel's** People & Computers; **Italy's** Computerworld Italia, PC World Italia; **Japan's** Computerworld Japan, Infoworld, Publish; **Korea's** Hi-Tech Information/Computerworld; **Mexico's** Computerworld Mexico, PC Journal; **The Netherlands's** Computerworld Netherlands, PC World, Amiga World; **New Zealand's** Computerworld New Zealand, PC World New Zealand; **Nigeria's** PC World Africa; **Norway's** Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge; **People's Republic of China's** China Computerworld, China Computerworld Monthly; **Poland's** Computers; **Spain's** CIM World, Comunicaciones World, Computerworld Espana, PC World, Amiga World; **Sweden's** ComputerSweden, PC/Nyheter, Mikrodatoren, PC World, Macworld; **Switzerland's** Computerworld Schweiz; **Taiwan's** Computerworld Taiwan, PC World; **United Kingdom's** Graduate Computerworld, PC Business World, ICL Today, Lotus UK, Macworld U.K.; **United States's** Amiga World, CIO, Computerworld, Digital News, Federal Computer Week, GamePro, InCider, Infoworld, International Custom Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish!, Run, Sun Tech Journal; **USSR's** PC World USSR, Manager, PC Express, Network; **Venezuela's** Computerworld Venezuela, Micro Computerworld; **West Germany's** Computerwoche, Information Management, PC Woche, PC Welt, Amiga Welt, Macwelt.



Judging By Other CASE Products, 80% Of Your Workload Doesn't Exist.

Most CASE products only scratch the surface of your development problems.

That's because they're designed exclusively for developing new systems. But when it comes to maintaining older systems—the biggest chunk of your workload—most CASE tools leave you out in the cold.

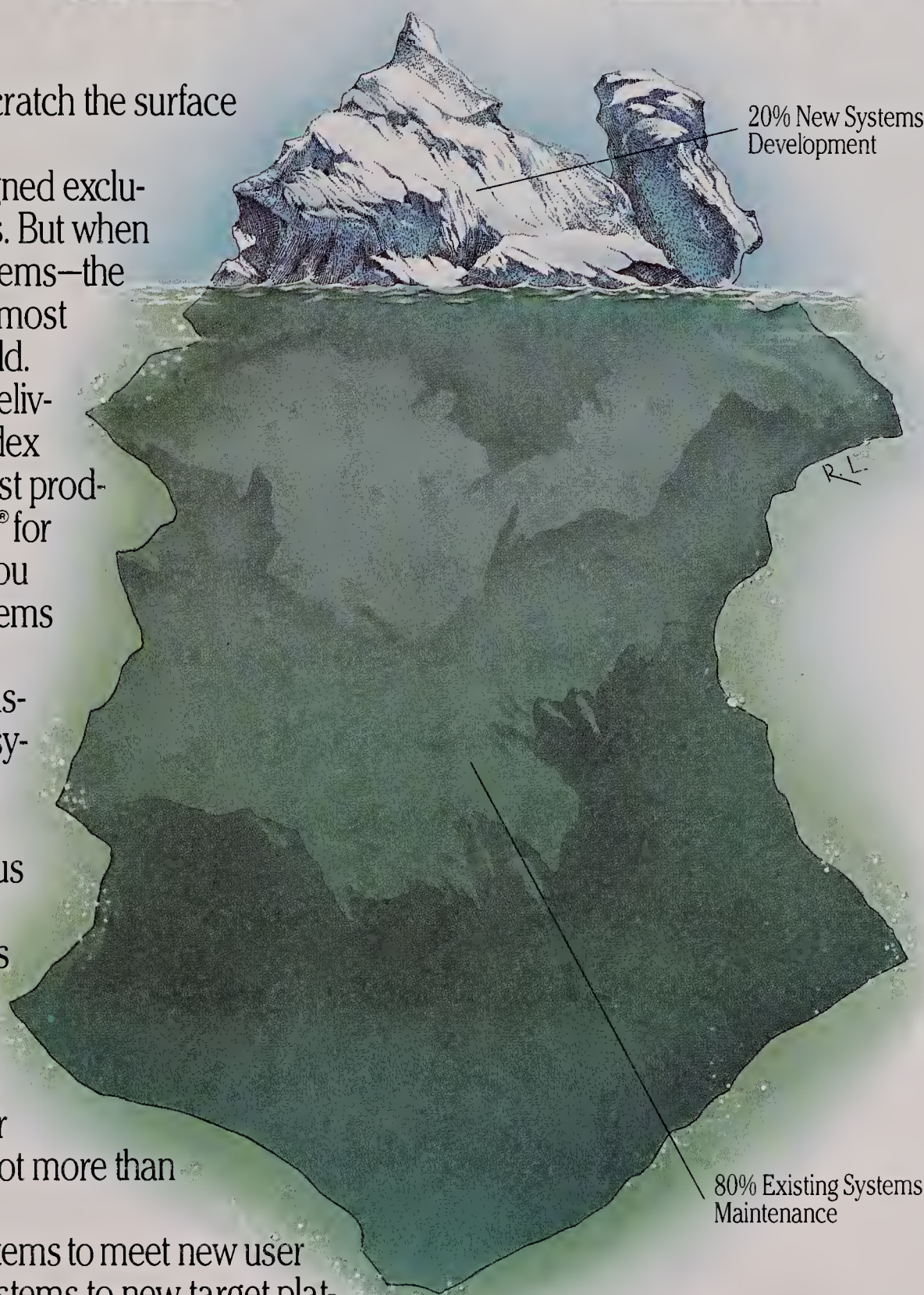
Fortunately, one company delivers a complete CASE solution: Index Technology Corporation. Our latest product offering,  Excelerator® for Design Recovery, lets you bring your existing systems into the CASE environment.

This innovative product translates complex code into clear, easy-to-understand diagrams. It scans COBOL data and procedure divisions, IMS database definitions, plus  IMS/MFS and CICS/BMS screen maps—and captures their underlying structures in a CASE repository.

With Design Recovery and the other powerful products in our Excelerator Series, you can do a lot more than just develop new systems.

You can also modify old systems to meet new user requirements, migrate existing systems to new target platforms, or even adapt old systems to support new business goals. All of which means you won't have to scuttle your current investments to keep pace with your changing needs.

For more about our complete CASE solution, call us today at 1-800-777-8858—before the biggest part of your workload takes you under. **Index Technology** There's No Substitute For Experience.



"Any who don't believe that information technology (IT) is changing everything should get out of management. When it comes to applying IT, some firms are 10 years ahead—and many are losing the race."

Tom Peters
Noted Author



Will your organization be a leader in the 1990s? For most information executives, this is the key question of the decade. We stand at the dawn of a new age—the age of global expansion. This is a time of tremendous opportunity as organizations position themselves for entry into worldwide markets, and it promises enormous rewards to the successful. Who will succeed in this highly competitive environment? Organizations that quickly respond to the changing needs of these markets while efficiently controlling their own global operations. Developing sound competitive business strategies in the global arena will be critical.

What will be the key issues confronting CIOs throughout the decade? According to a recent survey of our readers, the two primary concerns involve using IS for competitive advantage and aligning IS and corporate goals. These concerns are driven by the overriding pressure for CIOs to design efficient information systems to ensure that their organizations will be winners in the years to come.

CIO's next executive conference—"Perspectives: Maximizing Profits through Information Technology"—is specifically geared to help senior executives secure business payoffs for their corporations. We invite you to join us March 10-13, 1991, on Amelia Island Plantation, Amelia Island, Fla., for this important three-day event. To ensure your participation, register today by calling Lori Cardarelli or Diane Martin at 800-343-4935 (in Massachusetts, call 508-935-4631).

Remember, it's better to make history than be history.

Wynne L. Lutz

Coming In CIO

NEXT MONTH: SPOTLIGHT ON SOFTWARE

Up, Up and Away

With software costs soaring due to personnel, maintenance and development, some companies may want to rethink the role of IS in order to bring expenses back down to earth.

The Maintenance Attraction

CIOs hoping to protect their software investment should consider the variety of automated maintenance tools that are making everything old look new again.

The Quality Component

What's the best recipe for developing quality software? Practitioners discuss methodologies ranging from joint application development to rapid prototyping.

Fully Integrated Retailing

JCPenney believes that the key to software productivity is to focus on getting its systems up and running any way it can, whether that means buying, building or both.

OK, SAVE ME A SEAT.

___ YES, I'm interested in the Boole & Babbage 1991 Executive Briefing Series.

Check the preferred location:

- | | | |
|------------------|--------------------------|---------------------|
| ___ Dallas, TX | ___ East Rutherford, N J | ___ Atlanta, GA |
| ___ Chicago, IL | ___ Toronto, Ontario | ___ Boston, MA |
| ___ Columbus, OH | ___ San Francisco, CA | ___ Los Angeles, CA |

___ YES, I would like a copy of "The Impact of System/390TM and System ViewTM."

Name: _____

Company: _____

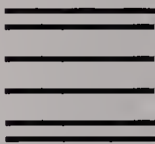
Title: _____

Address: _____

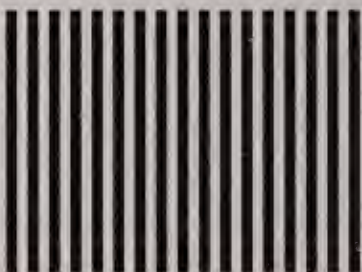
City: _____ State: _____ Zip: _____

Phone: (____) _____

System/390 and SystemView are trademarks of International Business Machines Corporation.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 723 SUNNYVALE, CA 94086

POSTAGE WILL BE PAID BY ADDRESSEE

Denise Day
Boole & Babbage
510 Oakmead Parkway
Sunnyvale, CA 94086-9807





**TOP-DOWN, BOTTOM-UP
DATA CENTER SYSTEMS MANAGEMENT.
IT'S JUST WHAT YOU'VE BEEN
HANGING AROUND FOR.**



It's here. The answer to data center productivity. Implement one step at a time with our snap-connect MainView™ products, which provide the benefits of IBM's® SystemView™ today. Call 1-800-544-2152 for our informative white paper, "The Impact of System/390™ and SystemView," and to find out about our 1991 Executive Briefing Series. Let Boole & Babbage be your most valuable resource in maximizing data center productivity. It's a whole new reason to hold on to your seat.



MainView is a trademark of Boole & Babbage, Inc. IBM is a registered trademark of International Business Machines Corporation. System/390 and SystemView are trademarks of International Business Machines Corporation.

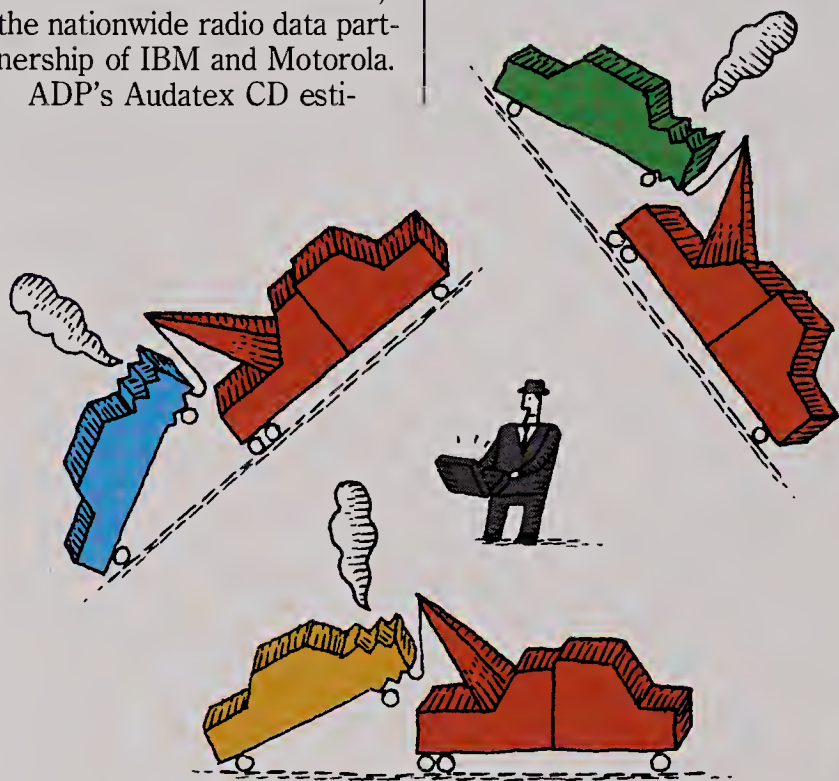
TRENDLINES

FENDER BENDERS

HIGH-TECH WRECK RECKONING

The typical automobile accident is often over and done with in the blink of an eye. Now, getting an accurate tally of the physical damage to the cars involved can take just a few seconds more, thanks to a marriage of laptop computer and portable telecommunications technology, the product of a joint venture between ADP's Automotive Claims Services division and ARDIS, the nationwide radio data partnership of IBM and Motorola. ADP's Audatex CD esti-

imating system provides the raw data that estimators need to make a precise appraisal of collision damage and the cost to repair it. In its basic form, with personal computer and CD-ROM, Audatex CD is a stand-alone system that gives estimators vehicle illustrations, parts and options lists, and the flat-rate tables that specify the amount of work



time needed to perform repairs. While Audatex CD was unveiled only last fall, the mainframe system on which it is based already helps process some 5 million collision damage claims per year.

The ARDIS network allows radio-equipped portable computers to transmit and receive data without a physical connection to a local telephone network. ARDIS's transmitters and receivers cover the vast bulk of the nation's urbanized areas and can reach 95 percent of all business activity, according to the company. Estimators whose laptops are tuned into the ARDIS network can automatically access Audatex's mainframe database in Ann Arbor, Mich., from accident scenes, garages, junkyards and the like, in order to get up-to-the-moment information on the price and availability of replacement parts and the location of the best deals. The Audatex mainframe can also help them screen claims for fraud and abuse.

With the advent of on-site estimating using online data, the industry is reaching for a new level of speed and precision in claims settlement. If the same technologies are used for the financial end of the process, the day could soon come when the settlement check is cut before the tow truck hauls off the remains. ■

TIME-SHARING VS. THE CLIENT/SERVER

Time-sharing network systems are significantly more cost-effective than client/server computing, according to a recent report from Cambridge, Mass.-based Forrester Research Inc. While hardware costs are lower for client/server, the immature state of the technology and the lack of development tools currently drive the cost of application-development and administration way beyond the cost of time-sharing systems.

According to the report, developing, installing and maintaining a turnkey client/server application today costs approximately 30 percent more than building a time-sharing system.

In addition to client/server's higher development costs, management tools for client/server are immature (or nonexistent), and LAN resellers do not usually offer the level of support that is included in mainframe- and mini-based systems, the report claims. Administration is further complicated when the IS staff is not on-site, and troubleshooting must be done remotely.

However, those attracted to client/server for its superior functionality and greater responsiveness need not despair: According to the report, with the emergence of tools to cut development time and with increased knowledge on the part of practitioners, costs for client/server computing will plummet over the next five years. ■

CIO SIM AWARDS

The Society for Information Management is offering IS professionals and executives a chance at publication and prize money in its 1991 International Paper Awards Competition.

Papers should address the theme "Creative Concepts and Applications in IS Management" and describe a work that has already been implemented and had a significant impact on the organization involved.

First-place papers will be printed in *MIS Quarterly*, and the author(s) will receive \$5,000 plus expenses

for one person to attend the SIM annual conference.

Abstracts of no more than 1,000 words must be received by Feb. 15 by Dr. Donald A. Marchand, dean of the School of

Information Studies at Syracuse University, Syracuse, N.Y. 13244-2340. For more information call 315 443-2736. ■



TRENDLINES

ON THE MOVE

The New York-based professional-services firm Ernst & Young has opened a Center for Information Technology and Strategy in Boston. Bernard F. Mathaisel, former CIO of the Walt Disney Co., will serve as the center's managing director. According to Mathaisel, Ernst & Young is well-equipped to provide the "understanding of and strong experience in business strategic planning, leading-edge technologies and the marketplace" required for consulting on IT strategy.

On the executive-search front, Korn/Ferry International has established an Information Technology Practice. W. Richard Howard, formerly senior IS executive at the Northrop Corp., has been named managing vice president of the new practice, which is based in Los Angeles. Howard said that the "information management executive is becoming as important to the strategy of running a modern corporation as was the financial officer a few years back. . . . We see the need for the CIO, with a strong team of business and technical executives, growing dramatically in the next five years." ■

COLLEGE ADMISSIONS

THE PAPERLESS CHASE

Document imaging has gone to college. The University of Southern California has installed an imaging system that enables its admissions department to convert the hundreds of thousands of documents (student applications, transcripts, letters of recommendation) it receives each year into manageable bytes. Admissions counselors can view interactively all these documents on a workstation, speeding up the time it takes to process student applications and financial-aid requests. USC claims the new imaging system has helped to reduce the six-week procedure for preparing student application files to just three weeks, and that the shift to digital records has helped free up space formerly occupied by paper files. The system

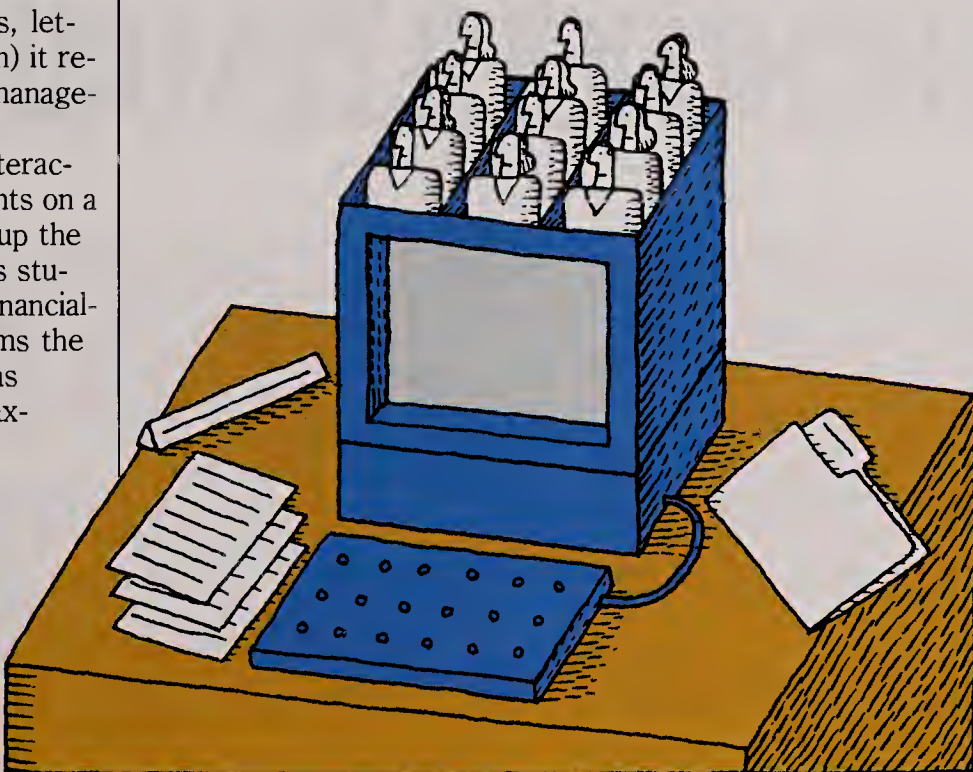
has also proved to be the cure for the lost-document syndrome.

Tom Meyers, director of information systems and research at USC, noted that competition for students is

heating up among colleges and universities (see "Electronic Ivy," *CIO*, October 1989, Page 17). The quicker USC can mail acceptance notices to the best and brightest students in its application pool, the greater the chances that these students will attend USC rather than a competitor.

The admissions imaging system was developed jointly by Wang Laboratories Inc., of Lowell, Mass., and USC. It runs on Wang's Integrated Image Systems, which are linked to the university's network of Prime Computer machines. Paper documents are scanned into the system and indexed into a database. USC has also incorporated Wang's Freestyle personal computing system into the admissions application, enabling counselors to electronically add handwritten annotations to applicants' transcripts while the images are viewed on a workstation.

Last Thanksgiving, USC and Wang announced that they had teamed up to market the student admissions processing application to other institutions. Both Wang and USC say that the system could be extended to such services as student recruiting, scholarship administration, registration and alumni records. ■



SPEED READING

Move over, Evelyn Wood. The days of spending a valuable Saturday in a Holiday Inn conference room to increase your word power are over if you own a personal computer. Now you can simply buy a FlashRead diskette and, in the privacy of your own home



(or office), increase your reading speed and comprehension.

Developed by Dr. Theodore Gross, a physician specializing in learning and behavior disorders, FlashRead is a computer program designed with a "linear reading" process that flashes groups of words on the PC screen and creates a fusion effect of these word groups into thoughts. This improves the skills found in fast and effective readers: never reading the same word twice, moving forward and reading groups of words. Program testing has shown a 20 percent increase in reading rate and comprehension in users. The program is not designed just for busy executives, however. It can adapt to any level of reading skill, from age 10 on up. FlashRead is available for both IBM PCs and Apple systems. It sells for \$49.95 from PVA Systems in La Jolla, Calif. ■



"My ultimate PC system? It's got to be compatible with everything I've got already... so you can move data from one PC to another on a floppy."



"Networking PCs is a pain. I'd like them designed to do networking without lots of configuration work... in networks I've already installed."



"The perfect PC would be an ideal client to all my information systems... putting data in the hands of decision makers in a form they can use."



"I'm tired of vendors changing operating systems. I want to drop a new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers from around the country to talk about their wildest desires in a personal computer system.

They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

They wanted a personal computer system that was compatible enough with their existing PCs to trade

files on floppy disks. Like Macintosh.[®]

They wanted a system with the flexibility to run almost any kind of software: MS-DOS, Macintosh and UNIX.[®] Like Macintosh.

They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.



"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it without compromising performance."



"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate retraining costs."



"Off-the-shelf software isn't enough. I need serious tools my existing programming staff can use to develop custom apps quickly."



"Macintosh? No kidding?"

Secret desire of 200 IS managers.

They wanted a system with sophisticated networking capabilities built in, that could access almost any host or file server via any network. Like Macintosh.

They wanted all these things in a wide range of personal computers. That would all work the same way and run the same software. Like Macintosh.

And they wanted development tools that would let their existing programming staff build applications quickly and easily. Like Macintosh.

In short, they wanted everything that Macintosh offers. But they just didn't realize they could have it today. For details, see an authorized Apple reseller.

Now that we know all of your secrets, it's time you found out about all of ours.



The power to be your best.™

TRENDLINES

ECONOMIC OUTLOOK

A CRISIS IN CONFIDENCE

When it comes to the health of the economy, it seems that consumers and executives alike have a serious confidence problem. As far as most are concerned, the U.S. economy is and has been in a recession, and the immediate outlook isn't likely to improve.

According to a survey of 5,000 American households sponsored by The Conference Board in New York, the Consumer Confidence Index edged downward in November following a record decline in October. Measured at 61.5 (1985 = 100), the index revealed that during the third quarter, consumers were "already thinking in terms of a recession," said Jason Bram, an associate economist at The Conference Board. Furthermore, consumers predicted that the downturn would continue for the first and second quarters of this year. More than 34 percent expected there to be fewer jobs now than there were in November, compared with 10 percent who anticipated more jobs.

Only 11 percent expected an improvement in business conditions compared with the nearly 30 percent who thought conditions would get worse. And while 22 percent expected their incomes to rise, most consumers planned to postpone major purchases.

Two other Conference Board surveys indicate that pessimism was also rampant among the executive ranks. In one survey, (see "Trendlines," January 1991), 600 CEOs expressed dire predictions about future economic growth, while another survey revealed that confidence among 1,000 top executives plummeted to the lowest level since 1980. For the third quarter of 1990, the measure of business confidence stood at 40, down from 46 and 48 respectively during the two preceding quarters. A measurement below 50 indicates that pessimists outnumber optimists. Consequently, Bram said, executives in November "believed that conditions would remain sluggish through the first half of [1991]." ■

CONSUMER CONFIDENCE

Expectations for Following Six Months

	Nov. 1989	Nov. 1990
Business conditions		
Better	17.6%	11.2%
Worse	8.3	29.5
Same	74.1	59.3
Employment		
More jobs	16.1	9.7
Fewer jobs	14.0	34.4
Same	69.9	55.9
Income		
Increase	29.3	22.3
Decrease	6.3	11.5
Same	64.4	66.2

SOURCE: THE CONFERENCE BOARD, NOVEMBER 1990.

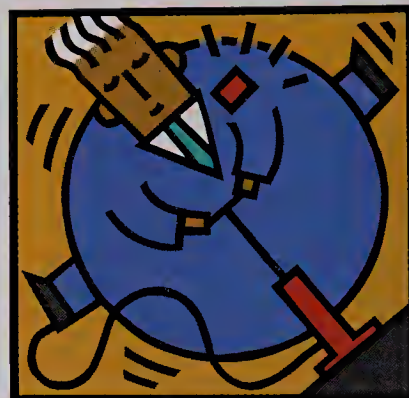
INFLATED TITLES

Exalted titles mean more than a personal parking space and the key to the executive washroom.

In a recent survey of 200 executives, 60 percent said a person's title is the best indicator of

his or her status within a company. But 53 percent also said that the incidence of inflated job titles has increased over the last five years, according to the survey's developer Accountemps, a Menlo Park, Calif.-based service for temporary personnel.

"The findings suggest that titles carry a great deal of power," said Accountemps Chairman Max Messmer. "When used appropriately, titles can play a critical role in setting realistic expectations, defining responsibility and establishing clear career advancement tracks. But if employees are to be properly motivated, titles must be earned, not bestowed." ■



CIO SALARIES

PAYING BY NEW RULES

CIOs are getting more respect—if the measure of respect is compensation. As information technology has become increasingly strategic to corporations, the CIO's pay has begun to mirror that of other top executives, according to Peter T. Chingos, the partner in charge of KPMG Peat Marwick's compensation consulting practice. "The CIO is getting membership to the executive suite," said Chingos. Increasingly, membership includes sharing in senior-management compensation programs, such as long-term incentives and executive contracts.

In a survey of 100 of the nation's top corporations, Peat Marwick discovered that CIO salaries at large technology-driven firms (such as top Wall Street businesses) range from \$444,000 to \$825,000. The survey also discovered that an increasing number of these

CIOs receive incentive packages that tie them to the overall performance of the company. The packages are structured so that "the amount of compensation to be earned is skewed more to the long-term than the short-term" and based upon such performance measures as the fair market value of the firm or, internally, benchmarks on return on equity and return on investment.

Moreover, added Chingos, "we're seeing organizations that are confident with executive contracts" beginning to extend them to CIOs as well. Typical senior-management contracts cover the terms of the position, the amount and nature of compensation, additional benefits—insurance coverage, company cars—and severance packages. CIO contracts generally have terms of from two to three years.

"Firms that are technology-driven will pay a premium and bring in the trophy CIO," noted Chingos. He added that the trend is clear: As an increasing number of companies recognize the strategic value of information technology, CIOs can look forward to the kind of respect they can bank. ■

ILLUSTRATION BY JULIA TALCOTT



The principle behind our Starlog phone systems.



Chameleons adapt to any environment. And so do our Starlog™ PBX systems, which can be easily customized to meet the needs of your business—no matter what shape or size it is.

If you need a 20 to 240 line system, choose the Starlog; for 70 to 512 individual lines, the new Starlog II. Both systems allow users to select those features and applications that are most useful to their jobs—hundreds of options, including everything from voice messaging to automatic call distribution.

There is also pre-packaged software that offers customized applications for a variety of industries, including telemarketing, healthcare and lodging, to name just a few.

And, of course, you get the benefit of Fujitsu's extensive service network, which includes 48 locations nationwide and is backed by Fujitsu Ltd., an \$18 billion global leader in computers and telecommunications.

So before you choose a less adaptable PBX, write to Fujitsu Business Communication Systems, 4605 E. Elwood St., Phoenix, AZ 85040 or call 1-800-553-3263. And let us color your opinion.

FUJITSU

The global computer & communications company.

© 1990, Fujitsu Business
Communication Systems.
Starlog and Starlog II
are trademarks of Fujitsu Business
Communication Systems.

TRENDLINES

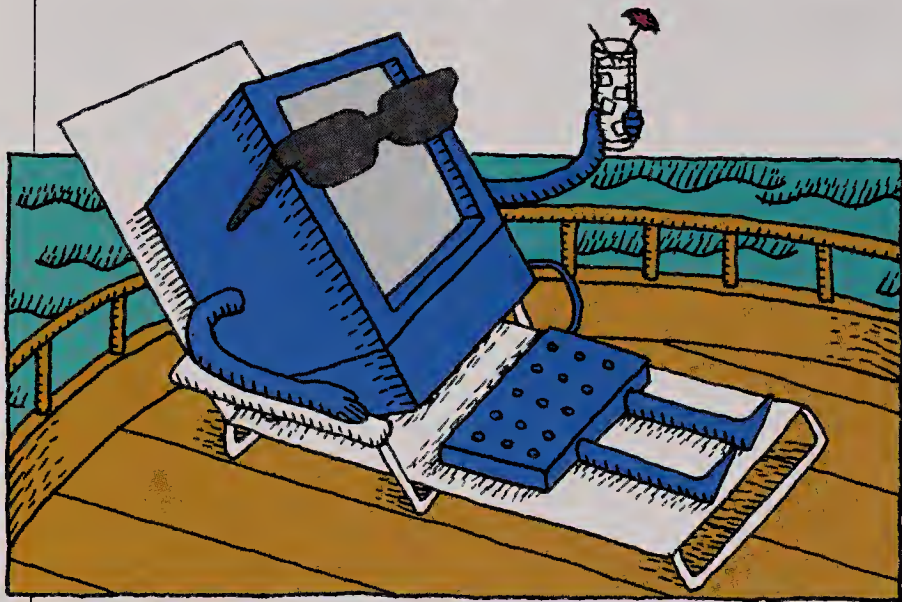
CUSTOMER SERVICE

POINT-OF-SAIL SYSTEMS

Kloster Cruise Ltd., parent of the Norwegian Cruise, Royal Viking and Royal Cruise lines, knows that running a cruise ship successfully requires more than shuffleboard and drinks with little paper umbrellas in them. Today, it may require a com-

puter. In fact, cruise lines are increasingly going the way of hotels by automating customer transactions in order to provide better service and management.

Kloster has installed integrated point-of-sale (POS) systems on each of its ships to



SOOTHING WORDS FROM A HIRE AUTHORITY

Being out of work can be a bummer, but it doesn't necessarily mean you're a bum, hiring experts agree.

A recent survey asked 243 members of the National Association of Corporate & Professional Recruiters whether they were willing to consider employed and unemployed candidates equally when making hiring decisions. Nearly 80 percent said that they no longer consider employment status when evaluating a job candidate.

"This is in sharp contrast to the traditional attitude of most hiring decision-makers, who almost always have assumed that an unemployed job candidate was a less desirable job candidate," said Lynn Tandler Bignell, board chair of the Louisville, Ky.-based NACPR. "The conventional wisdom used to be that if you lost your job, it meant that you were flawed or inadequate."

Today, Bignell said, even the most competent people have fallen victim to the slowing economy. The job market is being flooded by job candidates who are out of work because of downsizing, restructuring, mergers, acquisitions and budget cuts.

Not to mention the guys who got caught stealing paper clips. ■

track sales, services and inventories for the fleet. The IBM 4680 POS terminals run applications (developed by InfoGenesis of Santa Barbara, Calif.) that process customer transactions and route the information to the ship's property management system (PMS), where it is used to update customer accounts. The PMS resides on an IBM AS/400 or System/36 and receives information via a real-time link.

The system provides detailed reports on which items and services are selling, allowing food and beverage managers to manage their inventories more efficiently. The restaurant modules can send orders to the kitchen electronically and automatically ring up drinks dispensed from computerized bar guns. In addition to providing online credit-card verification, the terminals have a self-banking feature that allows servers to settle customer bills without a cashier and provides breakdowns of cash and credit business, allowing a restaurant to get customers in and out more quickly. Vacationers benefit from better, faster service and more accurate billing, which is fortunate, because at 500 miles from shore, they don't have much choice. ■

CAREER MOVES

DUWAYNE J. PETERSON, executive vice president of operations, systems and telecommunications for Merrill Lynch & Co., will retire in June. Peterson, who joined the giant securities firm from Security Pacific Corp. in 1986, will be replaced by Edward L. Goldberg, a senior vice president who has been with the company for 30 years.

J. BONNIE NEWMAN, assistant to the president for management and administration, is leaving her White House post to start an FM radio station in Hampton, N.H. She will also be a senior adviser to Exeter Holdings Ltd., an Exeter, N.H., business-acquisition firm.

JACK M. COOPER has been appointed to the new post of vice president and CIO for The Seagram Co. Ltd. Cooper, formerly president of CSX Technology, will head Seagram's worldwide information systems and services and be a member of the company's executive committee. ■

CIOs STILL IN DEMAND

Although it may not be booming, it looks like the demand for IS professionals is not about to go bust anytime soon.

According to New York-based executive search consultants John J. Davis & Associates Inc., demand will remain strong for CIOs who are able to integrate IS with corporate strategy and planning.

IS executives who have the ability to plan, organize and manage information flow will also continue to be in demand, as will strategic planners who have expertise in productivity improvement, computer-security and risk-management professionals, and telecommunications directors.

Prospects do not look as rosy for chief technology architects or communications planners. Davis predicts that demand for these professionals will be weak in the year ahead. ■

ILLUSTRATION BY JAMES KACZMAN



*The world, according
to your current
information system*



*The world, according
to the R/2 System*

Integrated business information. It's a major competitive advantage in today's global marketplace.

That's why 8 of the top 10 FORTUNE 500 companies already use the R/2 System from SAP.

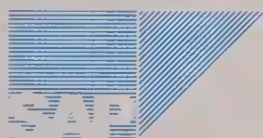
The R/2 System is an enterprise-wide software solution. It's unique in integrating key business functions, worldwide. From manufacturing to distribution to finance.

The result is a complete, global picture. With accurate, up-to-the-minute information. Available anywhere.

With European origins and worldwide presence, SAP understands the challenges of international business.

Add 18 years of continuous development on IBM mainframes and unmatched support, and you begin to see why the R/2 System is the global software strategy for 1300 companies around the world.

To find out more, call (800) 388-2235.



SAP. THE POWER OF GLOBAL VISION.™

SAP America, Inc., International Court One, 100 Stevens Drive, Lester, PA 19113
A subsidiary of SAP AG Walldorf, West Germany © 1990, SAP America, Inc.
IBM is a registered trademark of International Business Machines, Corp.

An Ounce of Prevention

The spread of computer viruses has reached epidemic proportions, but early diagnosis, prompt treatment and a little preventive medicine may go a long way toward halting the plague

BY RICHARD G. LEFKON

There is no March of Dimes to stamp out computer viruses. Other analogies to human epidemics may apply, but the successful worldwide eradication of polio simply cannot be repeated with these rogue programs. The difference is one of containment: Polio had a limited number of strains, which remained fixed targets while Drs. Salk and Sabin perfected their ammunition and bestowed it upon the world. By contrast, today there are at least 150 strains of computer virus (and a comparable number of cures for sale), and the number grows week by week. IS managers must actively manage virus risk containment, not just approve purchase orders for the bullets.

By its strictest definition, a computer virus is a parasitic section of code that appends itself to an exist-

ing program and surreptitiously diverts the processing to itself and then back into the host program. That way, the unauthorized code executes even if the program later malfunctions.

"Virus" also refers to the broader class of malevolent computer programs. These include Logic Bomb sections of main programs, which wait for a specified date before performing a shutdown or other designated task. Trojan Horse programs contain hidden instructions for unwelcome activities. Then there are Bacteria, which multiply inside the host computer until all resources are monopolized and processing grinds to a halt. And let's not forget Worms, which propagate by traveling through networks from computer to computer.

Most companies have experienced the agonies of one or another of these computer viruses, whether or not they were placed in the system maliciously. Viruses can destroy or alter valuable data and program files, change or delete computer directories and even cause costly hardware damage, such as ruining a hard disk by forcing countless physical reads and writes to the same track or segment. For this reason, it is essential that the CIO sit down with his or her managers and formulate a plan to cope with this menace.

An enterprisewide risk-containment, virus-prevention approach should address both access control and virus detection and include a recovery plan in case of infection. It should also be economical: If 800 users, working for minimum wage, have to spend an extra five minutes each day carrying out the policy, that's an investment of at least a million dollars annually.

Access control: This aspect of virus prevention updates the pre-



computer buzzphrase "need-to-know" with the more relevant "need-to-connect." Like biological contagions, the spread of viruses can be stopped by preventing their contact with susceptible media. For instance, worms often travel via electronic mail, both internally and by using modem access to public networks, and they can be halted by limiting access to that function. A workstation that has a business need to dial out, for example, might not require connection to the local area network. Unconnected business users with a vague desire to be cabled in might be willing to skip it if faced with a sign-up form requiring firm justification for the request.

Detection: It is a good idea to give everyone who uses a computer, whether networked or not, copies of a simple detection program. Those with dial-out capability or who work on home PCs should receive slightly higher-quality and more-costly detection programs—including a copy for that home computer. LAN support staff need better protection still, and both the PC and the mainframe area should have a loaded "quarantine box" to test samples of all new software—whether it is received on a magnetic medium or bundled into new hardware.

Detection products for viruses fall into three broad categories: integrity, scanner and TSR (terminates and stays resident). Integrity products, popular in both PCs and mainframes, alert the user with a beep if file length or other elements have changed since the last inspection. The drawback to these devices is that a user generally must respond to some beeps every time he or she logs on, whether or not the change was caused by a virus. This can be annoying if the user is working with certain PC graphics programs, or others that routinely get changed during normal use. And, as in the story of the boy who cried "wolf," the user may grow so accustomed to dismissing the beep by indicating "OK" each time it sounds, that he or she might not notice when a virus is actually present.

Scanners look for a particular data string known to be embedded in a particular virus program, then alert the user if the string is detected. A scanner searches all files and disks

requested by the user, typically during the first minutes of log on or when a new disk is inserted.

By contrast, a TSR is activated only when a new file is introduced. It does the same job as a scanner, but much more quickly since it does not examine everything.

Clearly, the effectiveness of scanners and TSRs depends on the completeness of the list of viruses they can detect. Fortunately, the major products in these categories can detect 95 to 99 percent of the attacks a company is likely to sustain over the next year or so. In more than one-third of these incidents, the offending virus will be a version of Jerusalem B, also known as the PLO or Friday the 13th Virus, which most commercial products can detect.

Recovery: This subject is familiar to—and handled well by—most data-center managers. Recovery is so important that it has been assigned its own track at the 1991 Computer Virus and Security Conference (March 14 and 15 in Washington), and it is built into the disaster plans required in many major installations. It depends on having something from which destroyed or damaged data can be recovered—usually a tape backup of key programs, files and operating systems. No matter what a virus-detection-product vendor may claim, it is always better, if possible, to wipe out an infected file and start over again from a recent backup rather than try to fix the infected data or program.

The data center, LAN administrators and business users should all take frequent backups of files and hold onto a few extra "generations" of each. If a virus doesn't reveal itself right away, and if the user only has yesterday's backup, he or she may be out of luck. How to get users to back up their files is another matter for discussion. The best solution might be to have the LAN do it for them after they've gone home rather than expect high earners to spend five minutes every Friday on an essentially clerical task.

Economy: Spending \$10 or less per PC on a site license is a bargain. Preparing and distributing updated floppy disks to 800 users every quarter is not—and the cost might make an otherwise well-thought-out risk-man-

No matter what a virus detection product vendor may claim, it is always better, if possible, to wipe out an infected file and start over again from a recent backup rather than try to fix the infected data or program.

agement plan impractical.

Minimizing costs where there is minimal risk is desirable; but maximizing effort where the danger of contamination is highest is essential. Salespeople who bring floppy-disk reports to customer sites must be given good decontamination software and the mandate to use it. PC support staff who service others must be required to "wash their floppies" each time they enter and leave the department. Typhoid Mary may have been replaced by Jerusalem B Jane; but the danger of contagion is just as great.

Most business users aren't losing sleep over the possibility of infection by a computer virus. It may take considerable persuasion to convince them to take such basic action as accepting a TSR, turning strange PCs off and on before using them, or write-protecting floppy disks containing files that must not be changed. The key is getting the CIO's own management to implement sensible policies and priming business users to accept them long before that memo and preventive disk ever reach their desks. □□

Dick Lefkon teaches management and computing at New York University, builds networks for Citibank and others and is the president of the Financial Industries Chapter of the Data Processing Management Association.



"We needed new technology to turn our passion for customer service into results. That's why we chose SAA."

Jay Dinwoodie, Senior VP/Information Systems, GE Capital Fleet Services

While some companies are wondering what IBM SAA™ can do for them, the people at GE Capital Fleet Services already know.

And so do their customers.

The company is America's leading car and truck fleet services business, and their goal is to cement that position by changing the rules, by redefining the word *service*.

SAA, or Systems Application Architecture,™ is key to that strategy.

They've built a complete SAA system, with a variety of applications running cooperatively on three IBM platforms: an ES/3090,™ an AS/400® and a multitude of PS/2® using OS/2®.

Easy to build.

According to Jay Dinwoodie, development has been quick and smooth.

"We implemented the first modules in March '90, and since then we've been adding new ones like building blocks. Which is the whole idea. SAA lets us hook things together—data, image, you name it—in ways we never could before. What we're doing here today could *never* be done the old-fashioned way."

Jay's users agree, especially the 45 mechanics who man the phones helping customers who have car trouble.

With SAA applications in multiple windows, they provide a level of service that's truly unique: diagnosing the problem, finding the best nearby garage, estimating the cost, negotiating discounts, determining warranty status, scheduling preventive maintenance and more, all while keeping detailed records, in minutes, in one phone call.

To a salesman stuck on the road, that's money in the bank. Ditto for GE Capital Fleet Services.

Easy to learn.

Says Jay, "We bring customers in and show them what we're doing. Nobody walks away unimpressed, and in fact, SAA's helped us win a number of new accounts."

Another big SAA advantage is training time, or lack of it.

"When we first got running, we went to the mechanics' area for a training session, to get some thoughts for writing a manual. We started at one end of the room, spent a few minutes with each guy, then moved on. We weren't half-way across the room when the first people were actually using the system, doing real work. We never did write a manual."

Easy to live with.

Their system is now running about 35,000 PC-host transactions a day, and Mr. Dinwoodie estimates that traditional technology would require about 250,000 transactions to accomplish the same work. He says, "Our SAA apps are just incredibly efficient, and they've been completely reliable."

How strange that some people are still asking if SAA is for real.

"It's just a question of confidence," says Jay. "We knew exactly where we wanted to go and that ultimately SAA was the only way to get there. So we took that first step, we've never looked back, and expectations—both ours and our customers'—have been exceeded."



At a time when big IS projects have a lot of people running scared, Citicorp's David Starr has subdued a strategic Goliath

STALKING THE KING- SIZED SYSTEM

BY THOMAS
KIELY



DAVID STARR *brought order*

Big systems don't scare David H. Starr. So what if the IS road is littered with big-system failures like Bank of America's \$100 million folly. So what if NASA eventually paid \$46 for each of the 25 million lines of code that went into its massive Shuttle program. Starr, who is senior director of information technology at Citicorp Services Inc.'s Global Payment Products Division, refuses to be intimidated by big systems anymore. During the last four years, he has successfully—

and cost-effectively—implemented the largest IS project ever undertaken by Citicorp. These days he feels like a victorious David, signing autographs beside a fallen Goliath.

But Starr readily admits that his task wasn't easy and that he, too, nearly failed. Just last summer, a number of independent analysts pronounced his project one big, expensive kludge. Starr's protracted effort to

CITICORP 



... out of chaos, re-designing a tangle of business applications and machines in the largest IT project ever undertaken by Citicorp.

PHOTO BY JOSE FERNANDEZ

bring order to the division's myriad systems, which supported Citicorp's traveler's-check business and assorted electronic-transaction products, seemed to have come to a bad end. A gloomy Starr contemplated the end of his career at Citicorp.

But Starr's top programmers groped for a plan to redesign the foundation of the system

“We have to be able to do things American Express can't do. We need to have lower volume costs, which is hard to do because their volume is much larger. So we had to do some pretty dramatic things to compete with them.”

—David Starr

they had created, and within weeks they settled upon a novel strategy they were convinced would work. Three grueling months later they began to test the system and to tweak it to completion.

It worked. Just before Thanksgiving, Citicorp turned off the first of its old systems and began to conduct business in a new computing environment—one that could boost the company's competitiveness in select markets. Now Starr has won the attention of Citicorp's top brass.

He can't stop chuckling about it all, at once relieved and elated. Seated at his desk in Citicorp's Tampa, Fla., facility, he swiveled in his chair and, grinning, recounted his experiences.

Starr is a likable, ebullient fellow, articulate about both his company's business and the technology undergirding it. His office looks out onto a long open floor full of desks: the rows of Citicorp troops whose jobs are changing because of what Starr has wrought, some of them a little, some quite a lot.

Starr left Price Waterhouse for Citicorp in 1986 to manage the Global Payment Products Division's data processing. The division of the giant New York-based Citicorp oversaw the corporation's VISA traveler's checks, money orders, electronic funds-transfer programs and assorted other products. The Tampa operation even pro-

cessed food stamps for the state of New York.

But when he arrived at his new job, Starr discovered an operation hamstrung by ancient, cumbersome information technology. There were 42 different systems supporting the operation's products, Starr recalled, and none of them talked to each other. Systems ran on a variety of machines of different vendors, and the software was a Babel of codes and structures. (Complicating things further, the division's administration and marketing operations were [and still are] in Chicago; the division also maintained a large processing facility in Buffalo, N.Y., and smaller facilities overseas.) A few of the systems were updated monthly, others weekly. There was little consistency to the data captured in each system. “It wasn't unusual for five different people to come into the room with five different computer reports, all of which said different things,” Starr recalled.

Managers were living with the inconsistencies, but they were not happy about it. Because the company's products were so balkanized, the division was organized around its products, so customer service was fractured. The company's 9,000 customers (mostly banks and corporations) could not get one-stop service for multiple Citicorp products, and Citicorp's product-oriented salespeople were tripping over each other in the field. Frustrated Citicorp managers wanted to angle their systems more toward the customer.

“But their main concern,” Starr explained, “was that new-product development times were long. We weren't able to react to the market quickly enough. We couldn't do much of anything in less than six months. In order for us to keep up with things that our competitors were doing, or to try to do things our competitors couldn't do, it was very expensive, very time-consuming.”

That made life tough in the traveler's-check business, where Citicorp runs a distant second to American Express. “We have to be able to do things American Express can't do,” Starr said. “We need to have lower volume costs, which is hard to do because their volume is much larger. So we had to do some pretty dramatic things to compete with them.”

That was exactly what Starr proposed, within months after assuming his new job. Division Executive and Chairman Robert E. Terkhorn and other division managers raised their eyebrows. After all, Citicorp had suffered its own Bank-of-America-style fiasco (and won't talk about it). They had seen big

Why Big Is Better

.....
Reflecting on the last four years, David Starr says he believes that big systems will soon come back into fashion

When I first started in data processing in the 1970s, everyone wanted to do big systems," said David H. Starr, senior director of information technology at Citicorp Services Inc.'s Global Payment Products Division. "And so many companies got burned over the following 10 years [on program failures]. We thought the era of big systems was dead. Now all the rules have changed. Machine capacities are different and less expensive, [and] we have new

development tools: prototyping tools, which can help you change things online, and CASE tools to make you more productive. And we're learning that we have to throw out all those tried-and-true methodologies—those systems-development life cycles that we grew up with—you have to throw them out with big systems. The emphasis now is on controlling the functionality, putting processes in place—it's not documenting everything.

"I've become convinced that a reason why big systems fail is that . . . too many people [are put to work on them]. It's difficult to convince people of that. If you have an accounting project and you want to get it done twice as fast, you put twice as many people on it. The same thing with an engineering project. But with data processing, if you add twice as many people, it may take twice as long. . . . You're not doubling but quadrupling the number of lines of communication [within the IS department, and between the IS department and end users].

"Now people who put in big systems are going to dominate the competitive markets. I think you have to do this. It's the only way to compete in a worldwide environment."
—T. Kiely



STARR: "The key was keeping management committed to this."

projects spiral out of control, grow too expensive to complete, and die. They didn't want to repeat that. But they didn't want to go on living with what they had, either.

Terkhorn recalled: "I'm not sure we totally understood the magnitude of the project [at first]. But we understood that it was big when we got into it."

The project Starr proposed was quickly dubbed the Integrated Systems Project (ISP)—and the title to the endeavor spelled out the goals. From the start, he sold it by getting the division's top managers involved. "We decided we couldn't do this project like everyone else does it, or we would fail, too," Starr asserted. "The key was keeping management committed to this."

Starr and his company's managers began by

defining the priorities of the project, using IBM's Business Systems Planning process, a strategy for mapping out a company's business functions and then matching these in a matrix to the data that each function requires. (For instance, analyzing float dynamics and maintaining employee benefits are business functions at most companies; both of these functions need access to tax data.) The group of managers who tackled this chore were adjuncts to the division's various organizational heads.

Once the nuts and bolts of the organization were cataloged, executive committee members debated the "critical success factors" of each application used in the business—essentially prioritizing the company's information systems. "These were the heads of organizations," such as marketing and operations, Starr noted, "and some of them were involved

Introducing The Application The World's Most Successful

Big or small, young or old, the most successful companies in the world have something in common: Computer Associates software.



Banking. Of the top 100 financial institutions in the banking industry, more than 80 are using CA-INFOPOINT®. It's the most advanced and efficient banking software solution ever developed.

Every day, CA-INFOPOINT's series of integrated components help more than 800 financial institutions minimize operating costs, strengthen assets, increase market share and streamline their organizations.



CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

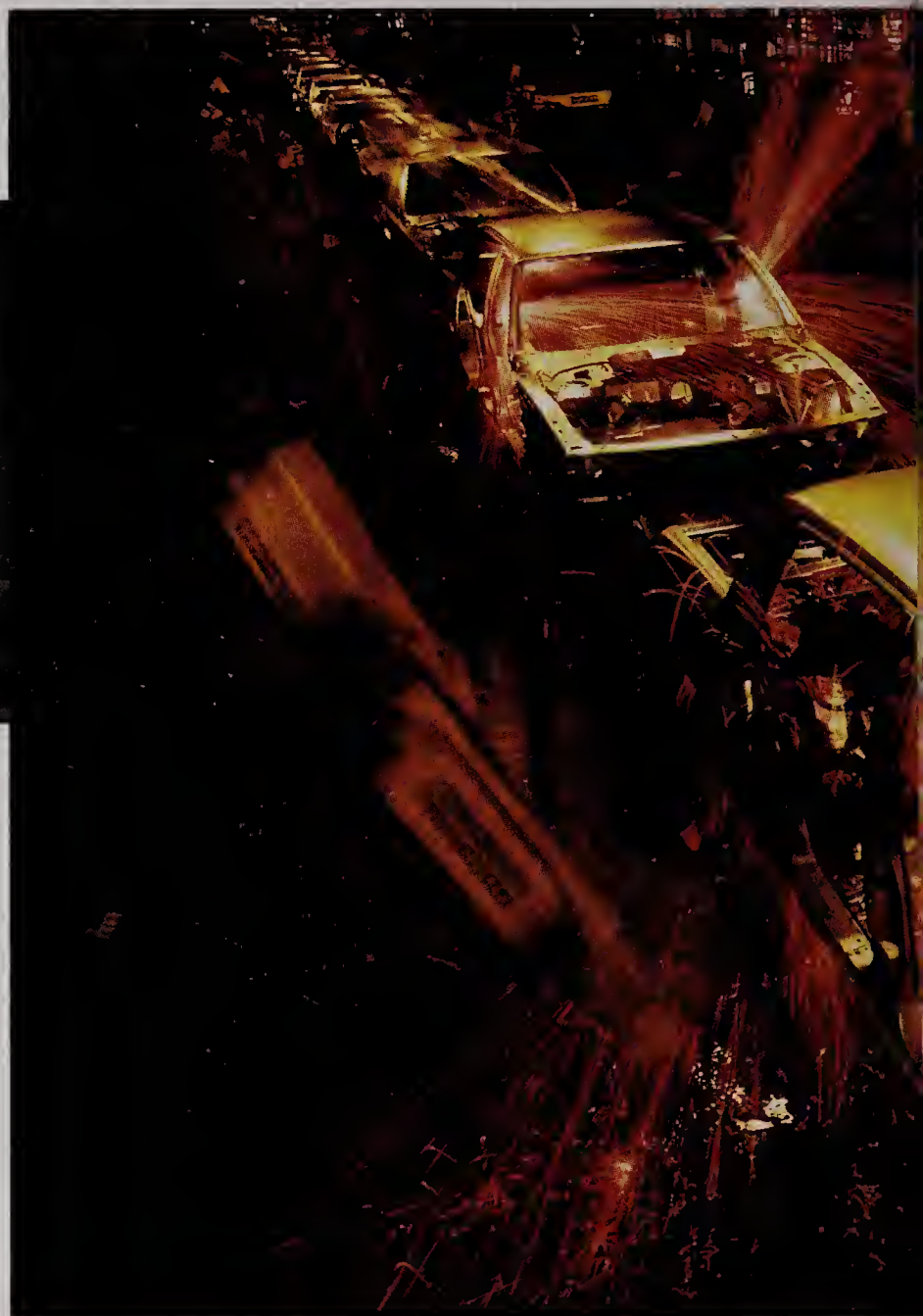
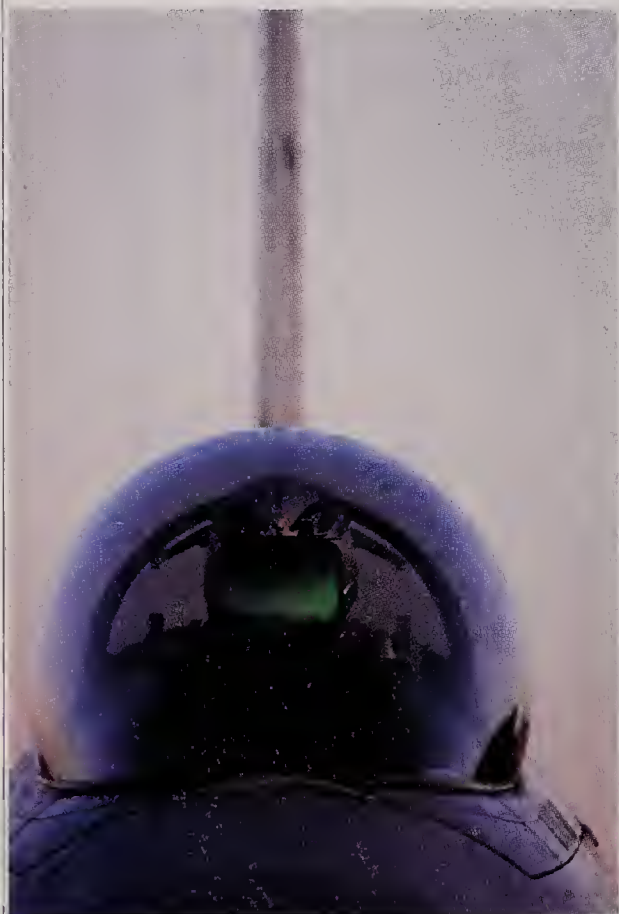
Aerospace & Defense. The firms that

time and time again successfully outbid the competition all have one thing in common:

CA-CAS/AD®.

It's the most advanced and feature-rich Aerospace & Defense MRP II manufacturing and financial management software available.

CA-CAS/AD gives the leading firms all the tools they need to increase the productivity of their people, capital and processes while complying with DOD regulations.



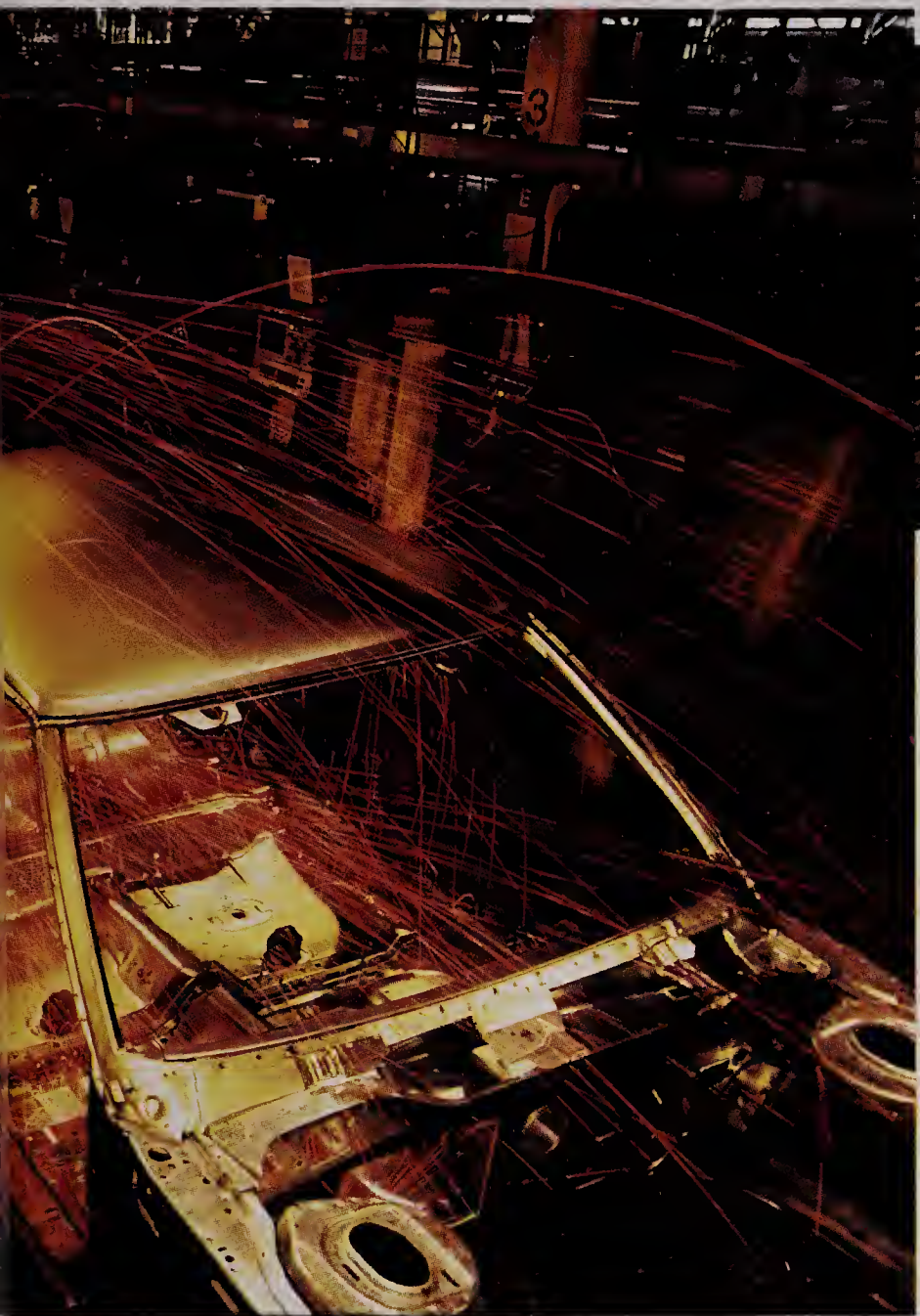
Financial. Wherever you find successful companies you'll always be sure to find something else:

The Masterpiece® series of financial software.

Across every major hardware platform, Masterpiece offers a single, comprehensive approach to corporate financial accounting needs including: General Ledger and Financial Reporting, Purchasing and Payables Management, Receivables and Credit Management,



ations Software Behind Successful Companies.



Distribution. From sales forecast to shipping to invoice, CA's physical distribution software, CA-DMS[®], offers a comprehensive and integrated warehouse management solution. Across a broad spectrum of industries, CA-DMS is helping the leading firms speed up delivery, streamline costs and maximize resources. In a business world where time is a critical resource, CA-DMS gives our clients a distinct, strategic advantage.

Human Resources.

Some of the smartest companies around take care of their most important resource with software from Computer Associates. From the initial interview to retirement, CA-HRS[®] offers a full-cycle, integrated, human resources management system including: Payroll and Personnel Management, Applicant Tracking and Requisition Control and Position-based Budgetary Control.

For more information on any of our proven, application software solutions call 1-800-645-3003. Call today and learn the difference between software for business—and software for success.



Fixed Asset Accounting, Order and Inventory Management, and Project and Labor Cost Tracking.

Manufacturing. Recently, the world's most renowned automobile manufacturer received industry recognition for being one of the most efficient and successful manufacturers in the world. And it was no surprise that they did it with our CA-CAS[®] manufacturing software.

CA-CAS is a comprehensive on-line, close-loop, net-change MRP II computerized manufacturing management system. It gives the world's leading manufacturers the vital planning and control information needed to achieve Total Quality, Just-In-Time, and Computer Integrated Manufacturing.



© 1990 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787
All trade names referenced are either the trademarks or registered trademarks of the respective manufacturer.



CITICORP'S
Tampa, Fla., facility has been visited by several of the company's top executives, who want a firsthand look at Starr's achievement.

in the project on a day-to-day basis. I think everyone learned a lot about the business as a result of this. And they could also see how these critical success factors would impact their MBOs [management by objectives], and these in turn are related to their performance evaluations." The planning process took three to four months. When it was done, in the spring of 1987, the development work began.

Then Starr announced that he was not going to "freeze the specs." In other words, his end users—the division's managers—would not have to live with whatever system came out of the planning stage, as though the committee's initial concepts were immutable. Instead, the IS department would continuously rewrite parts of the applications it was designing, in order to incorporate user changes over the duration of the project. "We were able to put in a lot of those gee-I-wish-I-had-thought-about-it-beforehand kinds of things" as users became more and more acquainted with the system, Starr said.

But more importantly, Starr explained, "if you freeze specs on a multi-year project, you're developing a system for a business that exists three or four years earlier than the day the system is turned on." Companies like Citicorp change their business over a two- to three-year period, Starr continued, "so if we [had frozen] the specs, we would have had something supporting something that wasn't there."

Still, this kind of flexibility can be risky—and very expensive. During 1988, the project ballooned. While Starr's development planners had originally estimated that ISP would require a million lines of code, programmers ac-

tually polished off 2.2 million lines by the time they were finished. Starr said that costs climbed only 30 percent over budget and that "the functionality of the system doubled," during this time. (The project cost between \$12 million and \$15 million by the time it was tested in November 1990.) Divisional managers grew nervous.

"I had some very painful monthly budget meetings [that year]," Starr admitted. "But I think it's a compliment to senior management that they did support me—they didn't fire me. They certainly didn't hesitate to beat up on me now and then. But they also continued to support me, which is really the bottom line."

He attributes much of the support to the initial planning process. Managers understood the system and the impact it would eventually have on their business. They also understood that the changes they were demanding in the evolving project were expensive. "Costs went up," Starr declared, "but people understood why they went up. We had to justify why they went up. And the justification process served its purpose."

But the changes were also tough on the 200 Citicorp IS professionals assigned to ISP. Mark F. Willman, one of Citicorp's ISP development leaders and director of project management and production systems, said that "not freezing the specs was very frustrating for technical people." Changes, additions and deletions in portions of the progressing system kept employees at their desks for long hours, late into the night and over weekends.

Starr credits the success of his project to all that hard work. He remarked candidly that he actively stole many of his best employees—including Willman—from other companies. He backed off his aggressive recruiting, he said, when "I got some calls from some of the companies [a number of which were customers] asking if we wanted to do business with them in the future."

Starr and Willman said that technical people were attracted to Citicorp by the chance to work, in teams, on a big project. "Where else can people do a 2 million-line project" rather than work on maintenance or accounts-payable programs, said Starr. For instance, at the onset of the project, his developers had to invent a computer program that would convert

the 6,500 data elements in the existing 42 systems into the 2,500 data elements called for in the new system. "Where else can they do something like this, that no one else has done before?" Brutal as the work was, Starr's attrition rate was below 5 percent.

Rising costs weren't the only hurdle Starr's department faced. In 1987, the Global Payment Products Division scuttled a money-order product that failed in the market. Starr's bosses might then have abandoned ISP to cover their losses—but in the end didn't.

"Throughout that whole thing, Bob Terkhorn stuck with us. He knew it was important. Courage is the only way I can describe it."

Managing the project was also difficult for Starr, who was often frustrated to have responsibility for it but not the authority to define it, push it and complete it. Used to the world of consulting, where he would deliver his opinion to the company president, Starr found it difficult to adjust to the role of facilitator. He had to learn how to persuade, coax, cajole and compromise.

"For a long time there were some very lonely periods where I was the only person who thought this was going to work," he said. "You have a lot of self-doubt, wondering if you're right. You can't tell anyone your doubts because they're all counting on you to tell them it's going to work. It's lonely. Sometimes it was real tough going home all alone."

It got a lot tougher. In the summer of 1989,

Starr invited some cold eyes to scrutinize the fruits of his department's two-and-a-half years' labor. Consultants from IBM, Amdahl, old friends from Price Waterhouse and analysts from within Citicorp independently looked at the project and modeled it. Each concluded that it would not work on current computer hardware.

"Costs went up, but people understood why they went up. We had to justify why they went up. And the justification process served its purpose."

—David Starr

"Input-output was the problem," recalled Bob Smith, director of technology operations for global payment products. The division could not expect to get the kind of fast transaction rates it would need out of the system as it was designed. "I told him we couldn't even do it with a Cray supercomputer," Smith said. IBM's consultant advised Starr to wait for the hardware technology to catch up to him.

"It was scary," Starr remembered. His office overlooks a small lake, resplendent with tropical birds. A 12-foot alligator resides near

Dave Starr's Big-System Checklist

Citicorp Global Payment Products, headquartered in Chicago, is a division of Citicorp, the nation's largest bank. The hub of the division's operations is located in Tampa, Fla. The division employs 1,600 people in 33 countries and handles a number of the bank's international products, including traveler's checks and electronic foreign-currency payments. David H. Starr, senior director of information technology for the division, managed the largest IS project ever undertaken at Citicorp.

What he began with: When Starr joined the division, it relied on 42 different business applications running largely on two IBM 3033 machines in Tampa, two IBM 4341 machines in Buffalo, N.Y., and a Tandem TNS-II in New York City. Specific applications ran on machines made by

Digital Equipment Corp., Hewlett-Packard, Burroughs, Perkin-Elmer, Concurrent and Amdahl. Applications were written in Cobol, PL/I, Fortran, Assembler and APL—some of them without documentation or source code.

What he ended up with: Starr created an integrated database and business-applications system running on a single Amdahl 5890 model 400e in Tampa and a single IBM 3081 in Buffalo. A Tandem CLX in New York feeds some international data to the system. All the other machines are gone, or going. Starr figures that he has increased his MIPS by 200 percent and decreased hardware costs by \$1 million a year over the last three years.

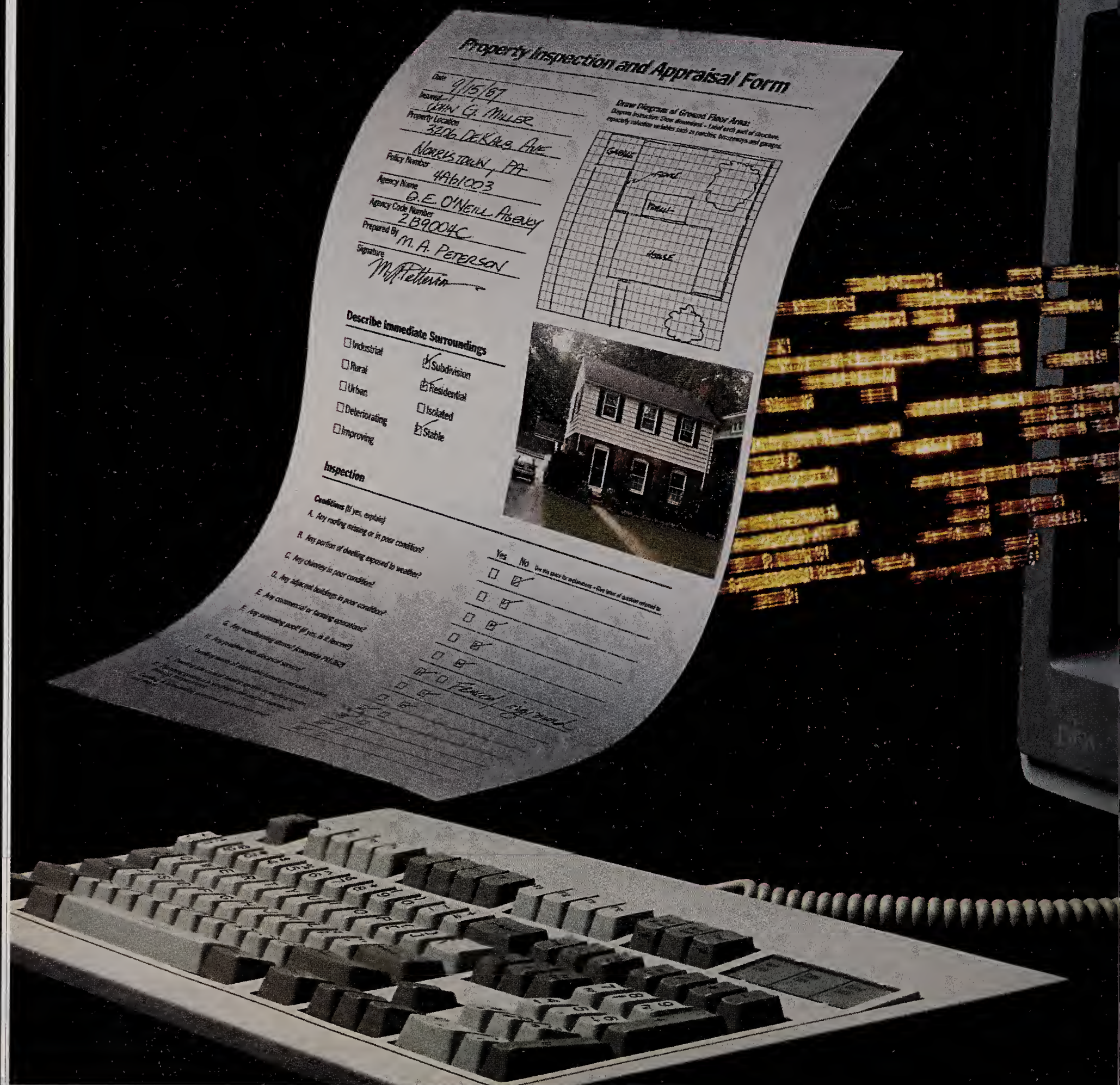
How he got there:

►Pirated good staff from other companies

- Gained top management's close participation in the project
- Employed a teamwork approach
- Prototyped, using tools like Computer Associates' ADS/A
- Used LU6.2 protocols
- Created a data-conversion system
- Developed several utilities programs for use on the project (a couple of third-party software vendors have expressed interest in these)
- Utilized 4GLs such as Computer Associates' ADS/O for IDMS
- Employed operating or capacity-planning tools such as BEST/I and CAPTURE from BGS Systems, Legent Corp.'s DASDMON, and Candle Corp.'s OMEGAMON

The bottom line: The ISP project has required 2.2 million lines of code, at an average price per line of \$5.50.

Unisys Infolmage Solutions. Take



Property Inspection and Appraisal Form

Date 9/15/87

Insured JOHN G. MILLER

Property Location 3216 DEKALA AVE

NORRISTOWN, PA

Policy Number 4A61003

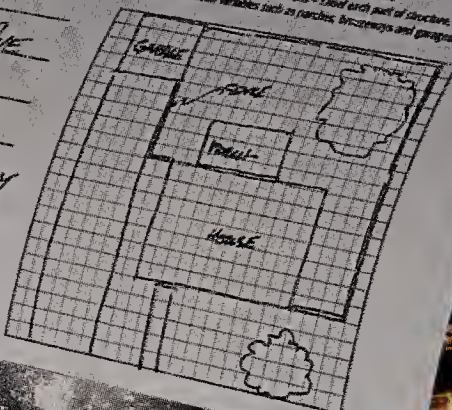
Agency Name G.E. O'NEILL Agency

Agency Code Number ZB9004C

Prepared By M.A. PETERSON

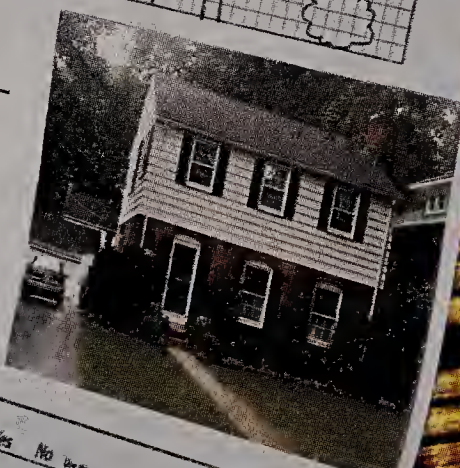
Signature M.A. Peterson

Draw Diagram of Ground Floor Area:
Diagram instruction: Show dimensions - Label each part of structure, especially selection variables such as porches, breezeways and garages.



Describe Immediate Surroundings

- | | |
|--|---|
| ☐ Industrial | ☒ Subdivision |
| ☐ Rural | ☒ Residential |
| ☐ Urban | ☐ Isolated |
| ☐ Deteriorating | ☒ Stable |
| ☐ Improving | |



Inspection

Conditions (If yes, explain)

A. Any roofing missing or in poor condition?

B. Any portion of sheathing exposed to weather?

C. Any chimney in poor condition?

D. Any adjacent buildings in poor condition?

E. Any commercial or farming operations?

F. Any swimming pool? (If yes, is it leased?)

G. Any weathering elements (downspouts, etc.)

H. Any problem with electrical service?

I. Any problem with plumbing service?

J. Any problem with heating service?

K. Any problem with cooling service?

L. Any problem with foundation?

M. Any problem with roofline?

N. Any problem with exterior finish?

O. Any problem with interior finish?

P. Any problem with landscaping?

Q. Any problem with other features?

Yes

No

Use this space for explanation - One year of service referred to

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

☐

☒

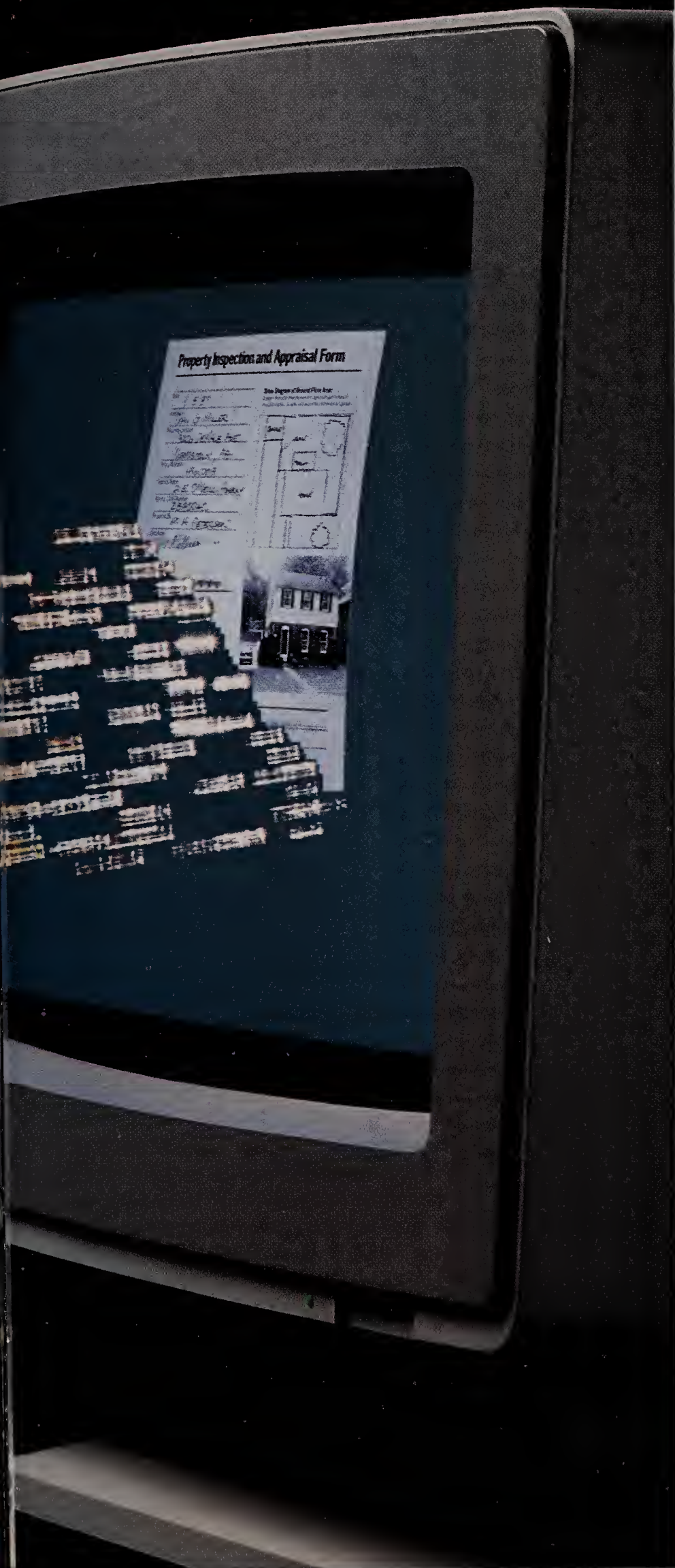
☐

☒

☐

☒

the paper out of paperwork.



Checks, blueprints, photos, claims, signed authorizations, maps – images that are vital to business and government.

And up until now, it's paper that's choking the information process. All because, unlike numbers and letters, images couldn't be manipulated electronically.

Quick access to documents, sharing them, moving them around and doing it cost effectively is what the Unisys InfoImage suite of imaging solutions is about. They're practical, modular solutions that fit easily into your existing information system, no matter whose name is on it.

Practical – because Unisys recognizes that not all documents are the same:

Customer Files. Those documents with signatures, handwritten annotations or photographs that couldn't be stored or sent electronically in the past are now efficiently handled with InfoImage Folder. With online access, you can respond fast to customers, process applications, handle claims.

Checks. Unisys InfoImage IIPS dramatically changes the way financial institutions handle paper and process checks. It reduces the heavy backroom staff burden and increases payment processing speed.

Engineering Drawings. InfoImage EDMS captures all of those oversized drawings and allows any organization quick access to a complete and accurate set. From engineering to purchasing to the shop floor.

InfoImage solutions from Unisys. They take the paper out of your paperwork. For more information and a demonstration diskette, call 1-800-448-1424, ext. 39.

©1990 Unisys Corporation
InfoImage is a trademark of Unisys Corporation

UNISYS

We make it happen

the lake. Starr could joke later that he thought of "sacrificing" himself to the alligator. But he was in no mood to joke at the time. He thought Citicorp's big system was dead in bed. "That was really the bottom of the whole thing," Starr admitted.

He let the division's managers know that "we had concerns, and we were working on

The power of this is that now we can have a complete client picture. We can have a complete sales picture, a country picture, and we could do some of these drill-down things that people dream about."

—David Starr

it," Starr said. "But we weren't willing to throw in the towel. We put together a team of some of our best people and said, 'Let's take a look at this and see if there is a better way to do it.' " The team brainstormed, and a solution came together in bits and pieces over the next two weeks.

The solution was novel. They decided to redesign the entire database so that it worked something like a local area network. Inside the mainframe, the database would look like seven different computers—in a sense, seven self-supporting PCs connected to a server. It would still appear to be an integrated database to users—and even to the mainframe. The transaction rate would be up to snuff. Only the software knew the whole thing was a fib. "What they decided was, let's just throw everything out and do something that nobody's ever done before," said Starr.

It worked—but it required another three to four months of intense labor. This was followed by a period of testing. "One of the really difficult things about big systems is that you have to test them all at once," Starr explained. "You can't put them in in pieces. It wouldn't be an integrated database if you had a whole bunch of little slices."

Just before Thanksgiving, Citicorp began to use the new system for managing its VISA traveler's checks. The company is converting one product at a time and hopes to have all its

products fused to the new integrated database by the end of 1991. Starr's group is already at work on enhancements, such as an EIS system, touch screens and new products.

But the database is the heart of the system, and that's finished. "The power of this is that now we can have a complete client picture," Starr said. "We can have a complete sales picture, a country picture, and we could do some of these drill-down things that people dream about."

It has also begun to change the business. Citicorp employees are being trained to work directly with customers, not with products. Many will see their jobs change dramatically, as manual processing jobs are phased out. "People shouldn't be doing repetitive, non-thinking tasks," Starr observed. Through intensive computer-based training, classroom training and on-the-job training, Citicorp is retooling most of its 1,600 employees to act as customer liaisons. "We have a big emphasis on customer service," said Starr. "We see that as our advantage over the competition. And the way we do that is to have human beings talking to customers and let machines do the stuff in the back office."

His own IS department will also become customer-driven, he predicts. "We're trying to teach the user groups to do a lot of that work themselves and not have to get in the queue to have us do it. We're moving toward end-user computing. We're putting in an information center here in Tampa. People will be able to phone into it from anywhere in the world to a centralized help desk."

He also saved some money in the end. Starr and Smith decided that they did not need the latest and greatest hardware to run their systems. "Basically," said Starr, "all I care about is how much it costs, and how much power it's going to buy me. I'm also concerned about service. So I said I would consciously stay one step behind IBM. When IBM came out with a new model, I'd buy the old model. The economics of that have been very favorable."

Terkhorn estimated that the total bill for ISP will run to \$20 million, "but it will pay that back over the next four to five years." He has also considered "outsourcing" his ISP team's experience with big systems to other Citicorp units—or even to clients outside the corporation.

In the meantime, several of Citicorp's top executives have traveled down to Tampa from New York to see the division's handiwork firsthand. No wonder Starr can't stop chuckling. ☐

Now Online
Business Reports From
Dun & Bradstreet
Business Credit Services



News Flash[®]
Eliminates
The Haystack.
Again And
Again.

Right now. This second.
You can find out what your competi-
tors are doing. Or read about a tech-
nological breakthrough in your industry.
Long before your competition does.

With NewsFlash. The electronic clipping
service from NewsNet that literally brings
you all the breaking news on topics *you*
specify. Often before it's in print.

In fact, as soon as the subject you choose
makes news, you can read about it. Because
NewsFlash has no time embargoes.

So the news can flash right on your PC.

Or even throughout your LAN.

With NewsFlash, you have instant
access to 10 domestic and interna-
tional newswires. And over 350 newsletters
and trade publications. All full-text, in-depth
reports written by the most respected
experts in the field.

Now every minute. Of every hour. Of
every day. NewsFlash can bring anyone in
your company intelligence that will put
you ahead of the competition.

Think about it.

Finding the needle in the haystack can be

that simple with NewsNet.[®] The database
system that makes you look sharp.

Call us and mention this ad. We'll put you
online for a free demonstration. Right now.
Right over the phone.

Call toll-free:

1-800-345-1301

Outside the U.S. call: (215) 527-8030

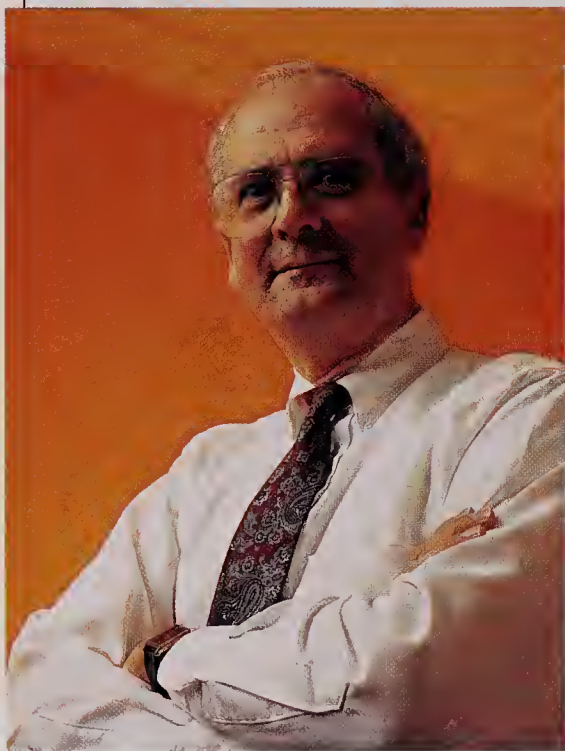
NEWS

NewsNet Knows It Now

945 Haverford Road, Bryn Mawr, PA 19010

Now that hard times have hit, most CIOs will have to join their fellow executives in cutting budgets. But they may get to do it with a scalpel rather than an ax—and some may even find themselves exempt from the bloodletting.

RETRENCHING TO COPE WITH RECESSION



PAT MULLEN: "A lot of forward-thinking CIOs are using this situation as an opportunity to make themselves more efficient."

BY DAVID
FREEDMAN

DEPENDING ON WHOM YOU talk to, we are either on the verge of a major economic crash landing or in the middle of a brief dip in confidence. Everyone can agree that these are far from the best of times, and chances that the current recession will turn out to be more than a mild one are too large to ignore. What does this mean for IT? Ten years ago, when IT was seen primarily as an expense, the question would have been easy to answer: IT would have been hacked back mercilessly. But now it is perceived as an establisher of competitive edges, a money-maker, a means to strategic ends. Will IT be cut back anyway?

The answer at most companies seems to be yes—but very, very

carefully. Organizations may want costs reduced, but they're not willing to sacrifice key strategies, especially those related to customer service, the 1990s rallying cry of corporations everywhere. As a result, companies are giving the CIO more leeway than they would have a few years ago. Indeed, some CIOs actually expect their budgets to grow, if they can identify lucrative opportunities or grave dangers to which IT can be applied. But a majority of CIOs may soon be facing their greatest challenge: paring down while moving ahead.

That could turn out to be quite a tightrope act. "The trick is to run lean and mean without cut-



IKE EICHVALDS:

Applications that increase productivity or improve customer service are sacrosanct.

budget hits. CIOs under the gun to make significant cuts "don't want to get caught cutting budgets across the board," he explained. "Instead, you need to prioritize all your efforts in terms of [their] impact on the organization, and then defer the ones at the bottom of the pyramid." In almost all cases, he said, the efforts at the top of the pyramid are systems that either lower the cost of producing and delivering the company's goods and services, or else raise their quality and improve customer service. "You don't see many CIOs rushing out and saying, 'Cut everything,'" he noted. "There are some systems that organizations simply can't afford *not* to continue investing in, like ATM networks at banks, package-tracking systems at freight-delivery companies or labor-reducing systems at manufacturing companies. Companies that haven't made those types of investments yet, and that continue to defer making them because of a recession, are likely to fall further and further behind their competition."

Even CIOs who are reconciled to slashing budgets and staffs face the reality that some IT plans, no matter how costly, are all but untouchable. The Bank of Boston, for example, hard hit by the suffering New England economy, has publicly promised nervous shareholders that it will cut non-interest expenses by \$100 million and eliminate at least 1,500 positions by the third quarter of this year. While Group Executive for Technology and Operations Michael Simmons, who has been given responsibility for overseeing the com-

ting into bone and muscle," said Robert Cawly, managing partner of the applied technology center of Price Waterhouse in Tampa, Fla. "Clearly, belt-tightening has to be part of a prudent, responsible course of action for CIOs, as it would be for any executive in these times. But at the same time companies are looking to

the CIO to continue to help capitalize on key business strategies and do a better job of servicing the customer. These are the kinds of investments that make a company more recession-proof."

The key to achieving these conflicting goals, said Cawly, is to develop a careful strategy for taking the

PHOTO BY BOB PERRY

WHEN YOU CALL
TANDON
YOU GET A PERSON.

OF COURSE,
YOU CAN ALSO
GET A COMPUTER.

At Tandon, we believe in selling ourselves, not just our computers.

That's why our direct sales force is made up of friendly people who are good at listening and great at helping. A highly knowledgeable group who truly enjoy answering questions about our computers.

Whether it's about our 486 EISA Desktop, a machine PC Computing described as "slick, amazingly fast, innovative and reasonably priced by 486 standards," or our equally impressive line of 386's and other 486's.

They'll also tell you everything you want to know about our high performance Slimlines, Desktops, Laptops and Network Stations, as well as our Towers.

All of which are made with the outstanding quality you'd expect from a \$400 million U.S. company with fifteen years of manufacturing and design experience, sixteen patents, and extensive research, development and engineering facilities.

But of course, we're concerned with more than just making a sale. That's why if for any reason you're not completely satisfied with your Tandon Computer, you can return it for a full refund within 30 days. And that's why every Tandon Computer comes with a one year limited warranty. On site service. And technical support. We even offer a special leasing program for your convenience.

So, pick up the phone and call one of our helpful sales representatives today. Next to our machines, they're as user friendly as you can get.

Tandon

TO ORDER DIRECT, CALL NOW:

800-800-8850

FAX 805-529-8408



Tandon LT/386sx Laptop

\$2,499

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel® 80386sx running at either 6 or 16 MHz. Main board has socket for an optional math coprocessor.

Memory: 1MB memory standard, expandable to 5MB.

Storage: 1.44MB, 3.5 inch, high density, double sided diskette drive. 40MB IDE hard drive.

Keyboard: 82 key layout emulates 101-key keyboard with embedded keypad and 12 function keys; system supports external keyboard and external 10-key keypad.

Video: Built-in VGA monitor adapter. Dual panel EL backlit monochrome VGA liquid crystal display. I/O port to support external VGA monitor.

Leasing: As low as \$142/month.

Call for information on our LT/286 Laptop.



Tandon 386/33 Desktop

\$3,999

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80386 running at either 8 or 33 MHz. Main board has socket for Intel 80387 or Weitek™ 3167 math coprocessor.

Memory: 4MB of standard memory, expandable to 16MB of 32-bit memory.

Storage: 1.2 MB, 5.25 inch, high density, double sided diskette drive, OR 1.44MB, 3.5 inch, high density, double sided diskette drive. 110MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adaptor with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$140/month.

Call for information on our 386/25 Desktop.



Tandon 386sx/N Network Station

\$1,199

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80386sx running at 8 or 16 MHz. Main board has socket for 80387sx math coprocessor.

Memory: 1MB memory standard; expandable onboard to 8MB, 16MB system maximum.

Keyboard: 101-key enhanced layout.

Video: Built-in VGA adapter. 14 inch VGA monochrome display.

Options: 1.44MB, 3.5 inch, high density diskette drive. 40MB IDE hard drive.

Additional options available, please call for details.

Call for information on our 286/N Low Profile, Network Station, starting at \$949.

Leasing: As low as \$68/month.



Tandon SL 386sx/20 Slimline

\$1,999

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80386sx running at either 8 or 20 MHz. Main board has socket for 80387sx math coprocessor.

Memory: 1MB memory standard; expandable onboard to 5MB, 16MB system maximum. (With expansion board.)

Storage: 1.2MB, 5.25 inch, high density, double sided diskette drive, OR 1.44MB, 3.5 inch, high density, double sided diskette drive. 40MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adapter with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$113/month.



Tandon SL 486/25 Slimline

\$3,999

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80486 running at either 8 or 25 MHz.

Memory: 2MB memory standard; expandable onboard to 5MB, 16MB system maximum. (With expansion board.)

Storage: 1.2MB, 5.25 inch, high density, double sided diskette drive, OR 1.44MB, 3.5 inch, high density, double sided diskette drive. 110MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adapter with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$140/month.

- 30-Day Moneyback Guarantee
- Toll-Free Technical Support
- 1-Year Limited Warranty
- On-Site Service
- Leasing Program Available



Tandon 486/33 EISA Desktop

\$7,299

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80486 running at either 8 or 33 MHz. Main board accepts a Weitek 4167 coprocessor to coexist with the 80486's built-in math coprocessor.

Memory: 4MB memory expandable to 64MB of 64-bit memory.

Storage: 1.2MB, 5.25 inch, high density, double sided diskette drive, OR 1.44MB, 3.5 inch, high density, double sided diskette drive. 200MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adapter with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$182/month.



Tandon Tower 386/33

\$4,999

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80386 running at either 8 or 33 MHz. Main board has socket for Intel 80387 or Weitek 3167 math coprocessor.

Memory: 4MB standard memory, expandable to 16MB of 32-bit memory.

Storage: 1.2MB, 5.25 inch, high density, double sided diskette drive. AND 1.44MB, 3.5 inch, high density, double sided diskette drive. 200MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adapter with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$143/month.



Tandon Tower 486/33 EISA

\$7,699

STANDARD CONFIGURATION

Microprocessor and Main Board: Intel 80486 running at either 8 or 33 MHz. Main board accepts a Weitek 4167 coprocessor to coexist with the 80486's built-in math coprocessor.

Memory: 4MB memory standard; expandable to 64MB of 64-bit memory.

Storage: 1.2MB, 5.25 inch, high density, double sided diskette drive. AND 1.44MB, 3.5 inch, high density, double sided diskette drive. 200 MB IDE hard drive.

Keyboard: 101-key enhanced layout.

Video: 16-bit VGA adapter with 256KB RAM, expandable to 512KB. 14 inch VGA monochrome display.

Leasing: As low as \$189/month.

OPTIONS AND CUSTOM CONFIGURATIONS

- Hard Drives, Diskette and Optical Drives
- Memory Expansion
- Modems
- Coprocessors
- VGA and Super VGA Monitors.
- Additional Options Available On All Systems. Please call.



MICHAEL SIMMONS: *"We're counting on technology to be able to use our resources more efficiently."*

panywide downsizing, has vowed that IT will see its fair share of cuts, he noted that some IT investments are crucial to keeping the downsizing efforts from damaging the company. "We're going to keep the DP budget flat or down," said Simmons. "But we're also counting on technology to be able to use our resources more efficiently."

Simmons said the budget-cutting has led to a reassessment of which IT projects need to receive how much attention when—and he expects to

reassess the situation over and over again as the business climate evolves. "We're not neglecting any area of IT, but we're restacking the priorities," he said. "Instead of working on 200 things at once, we're focusing on 20 or 30. As time goes on, the projects that are on the second tier might move up to the first tier. Banking products change, regulations change, and we have to be able to change with them."

One area that Simmons claimed isn't likely to see any cuts: systems

that strengthen the bank's relationships with its customers. "In hard times, people are a lot more alert themselves to the details of their financial dealings," he explained. "They really want a better idea of what's going on." One of the projects Bank of Boston is undertaking to address this need will increase the functionality of its existing teleservicing system in order to allow the bank's phone representatives to pull up more information about a customer more quickly when a customer calls. The project will also add a new, easier-to-use interface and beef up the network in order to speed up the rate of information transfer. And by tying the data network into the telephone network, phone calls will automatically trigger a file transfer. Needless to say, such work doesn't come cheap, but Simmons insisted the bank won't begrudge a penny of it. "These are resources we feel we have to invest," he said.

Focusing on such high-impact areas will allow the bank to reduce IT expenditures while strengthening its business. But Simmons conceded that this approach is largely a delaying tactic meant to see the bank through tough times; adopting it as a permanent strategy would be at the bank's peril. "You get more from your buck when you concentrate on specific items, but you can't maintain this level of concentration for years," he said. "This is something you do from time to time, always backing off from it."

One area that might get put off for the time being, but to which Simmons is committed to return as soon as possible, is that of developing a common software platform for all of the bank's divisions. "A common platform will make tracking and reporting data easier, and that will improve levels of customer service," he said. "We have to continue to make

that sort of infrastructural investment for the long term. The best example of what happens if you don't is the situation in our towns and cities, where 40 percent of our bridges need major repairs."

These issues aren't unique to large banks. S-K-I Ltd., a Killington, Vt., company that owns and operates ski resorts in the Northeast and the West, is facing the same sorts of decisions. In addition to the Northeast economic slowdown, S-K-I is still reeling from last year's unusually bitter cold in the Northeast and lack of snow in the West. Last year, for the first time in the company's history, earnings per share didn't increase. The result: The company ordered a 15 percent reduction in staff for all departments, including IT.

"We were lucky in this department, in that we were able to do it all by attrition," said S-K-I IS Director Ivars "Ike" Eichvalds. "I'd love to replace those positions, but the earliest we'd be able to do so is next October."

Staff reduction isn't the only measure Eichvalds has had to undertake to meet the company's belt-tightening goals. The department had been planning to buy new disk drives for its IBM AS/400, but that purchase has been put on hold. To make room on the existing drives for new data, a good deal of historical data has been taken offline and stored on tapes. That may not sound like a tragedy, but S-K-I executives had become addicted to doing frequent and complex analyses of historical lift-ticket and restaurant sales data to support their decisions. "We're used to running five-year revenue comparisons down to the level of a work area," said Eichvalds. "We can look at how a particular bar did in 1986 with a particular level of staffing compared to how it's doing now. The data is still here, but now we'd have to load tapes to get at it. We're really cutting back on some sacred cows."

Other economies include canceling the development of enhanced accounting and financial-reporting systems for the AS/400; much of the

functionality of the planned systems will be available at the desktop through PC packages, but Eichvalds noted that even the company's new '486-based PCs aren't powerful enough to massage more than a small piece of the corporate databases at a time. In addition, Eichvalds has put a six-month moratorium on attending programming education courses, long one of the department's most appreciated perks. Keeping morale up in the face of these sorts of cutbacks, he noted, has become a challenge. "We're instituting some incentive programs to recognize employees that are the biggest contributors, including cash awards and vacations," he said. "We'll probably have to do more of this as time goes on."

Not everything in IT is falling under the budget ax at S-K-I. It's still full-speed-ahead for applications that

tions, so that managers can quickly shift staff around to cover unexpected shortages. S-K-I is also investing in more PC networks, on the assumption that they will pay for themselves by putting off the need to move to a larger central system.

Belt-tightening isn't as big an issue if your belt is at the last notch to begin with. That's the case at K mart in Troy, Mich., which has already made many of the IT-based customer-service and productivity improvements for which other companies are now frantically scrambling. As a result, said K mart Senior Vice President of Corporate Information Systems David M. Carlson, the company is now positioned to run comfortably on a no-frills IT plan. "As a low-cost supplier, we always manage our resources tightly, and I

"We're used to running five-year revenue comparisons down to the level of a work area. . . . The data is still here, but now we'd have to load tapes to get at it. We're really cutting back on some sacred cows."

—Ivars Eichvalds

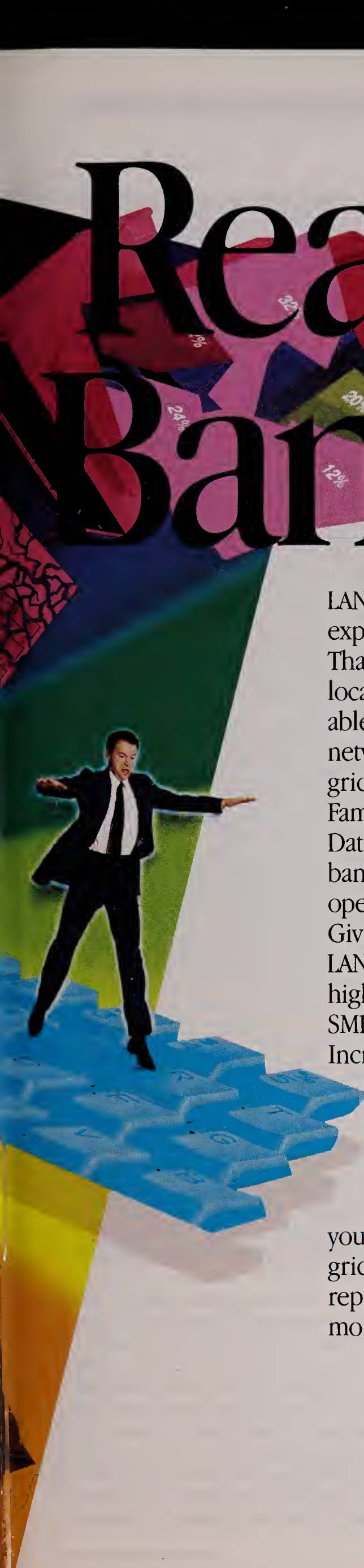
increase productivity or improve customer service. "We're spending more in these areas than ever before," said Eichvalds. "Anything that gets the customers what they need to make this the most enjoyable skiing experience possible, or that reduces our operating costs, is seen as something that simply has to be done." Among the new projects being rolled out this season: an enhanced lift-ticket system that allows skiers to buy almost any kind of ticket from any window; a videotex system that displays trail and weather conditions on television screens in lodges and hotels; and a time-gathering system that keeps track of which employees are working at which loca-

don't see any reason why the softening economy would lead to any major material disruption in our plans," he maintained. "In fact, this is the time when we expect to recover much of the investment we've made in technology over the last five years."

That investment has included a recently completed satellite-based network that extracts information on every single item run through the checkout scanners at all of the company's 2,200 stores and brings it to the corporate data center each evening. It is an application crucial to K mart's customer-service and cost-reduction goals. "In addition to the general slowness that you see during times of economic weakness," ex-



Real-World Bandwidth.



LAN networking and LAN gridlock. With today's data explosion, the two pretty much go hand in hand.

That's the real world. But your local phone company will be able to offer high-bandwidth networks that unblock the

Switched Multi-megabit Data Service

gridlock. AT&T's BNS-2000 Broadband Networking Family will provide the first Switched Multi-megabit Data Service (SMDS)SM on the public network. A bandwidth-on-demand switch, the BNS-2000 will operate at speeds of between 1.5 and 155 Mbps.

Giving you access to bandwidth that can interconnect LANs across entire cities. Bandwidth that can provide high-performance, connectionless data services like SMDS and Metropolitan Area Networking (MAN).

Increasing productivity. Taking you one step closer to the broadband ISDN applications you want.

Without major investments in hardware or disruptions to your private network. BNS-2000.

Successfully being trialed by several local telephone companies, it will provide bandwidth you can count on. Bandwidth that truly unblocks LAN gridlock. Call your local telephone company marketing representative or call 1 800 638-7978, ext. 6010 for more information.



AT&T

Network Systems

The Economic Weather Report

Not many people like to use the "R" word. But it's clear that at least for now, the country's in a very definite economic decline.

Are we really in a recession? If so, how bad are things likely to get? Here's what two experts had to say before we went to press last month. As both pointed out, their projections are dependent on how things continue to develop in the Middle East.

Cynthia Latta
Financial economist
DRI/McGraw-Hill
Lexington, Mass.

"I would say that we are in a recession right now. I anticipate a [continued] drop in the first and second quarters of '91, but this will be one of the milder recessions. Durable goods will have the hardest time because those are the purchases that can best be postponed. The

economy should bottom out in the spring.

"In making our projections, we're assuming that there's some sort of negotiated settlement in the Middle East. Our baseline forecast assumes that there's not going to be a shooting war.

"We had a sluggish economy before the invasion of Kuwait, [but] what really tipped us over the edge was the blow to consumer confidence in August. The S&L problem [also helped to] undermine our growth. We had constructed [too] much commercial space in advance of the demand for it.

"The Northeast is probably the hardest-hit region. Southern California will be especially hard hit because of overbuilding, speculating and defense cuts. The Southeast will probably fare the best because it has a diversified manufacturing base. In the entire economy, exports are the key."

Delos Smith
Senior business analyst
The Conference Board
New York

"The economic situation now is not caused by economic conditions, but there is a political recession. The savings-and-loan difficulties have wrecked the housing and construction industry. Banks are so worried about bad loans, people must have perfect credit. The wholesale inven-

tory numbers are very, very low. [And] look at the debacle of the federal deficit situation.

"The biggest factor is the Middle East crisis; what it has done economically is profound. The consumer-confidence index has really plunged. Executive confidence has plunged [see "Trendlines," Page 16]. When the business and consumer sectors are defensive together, these are political recessions caused by political problems. The great danger of this is that it will have a rippling effect, and there could be truly an economic recession.

"[We see] sluggish, slow growth, [with] exports remaining strong. The Middle East crisis is really the wild card. I just wonder if the administration has really thought through the damage that it is causing.

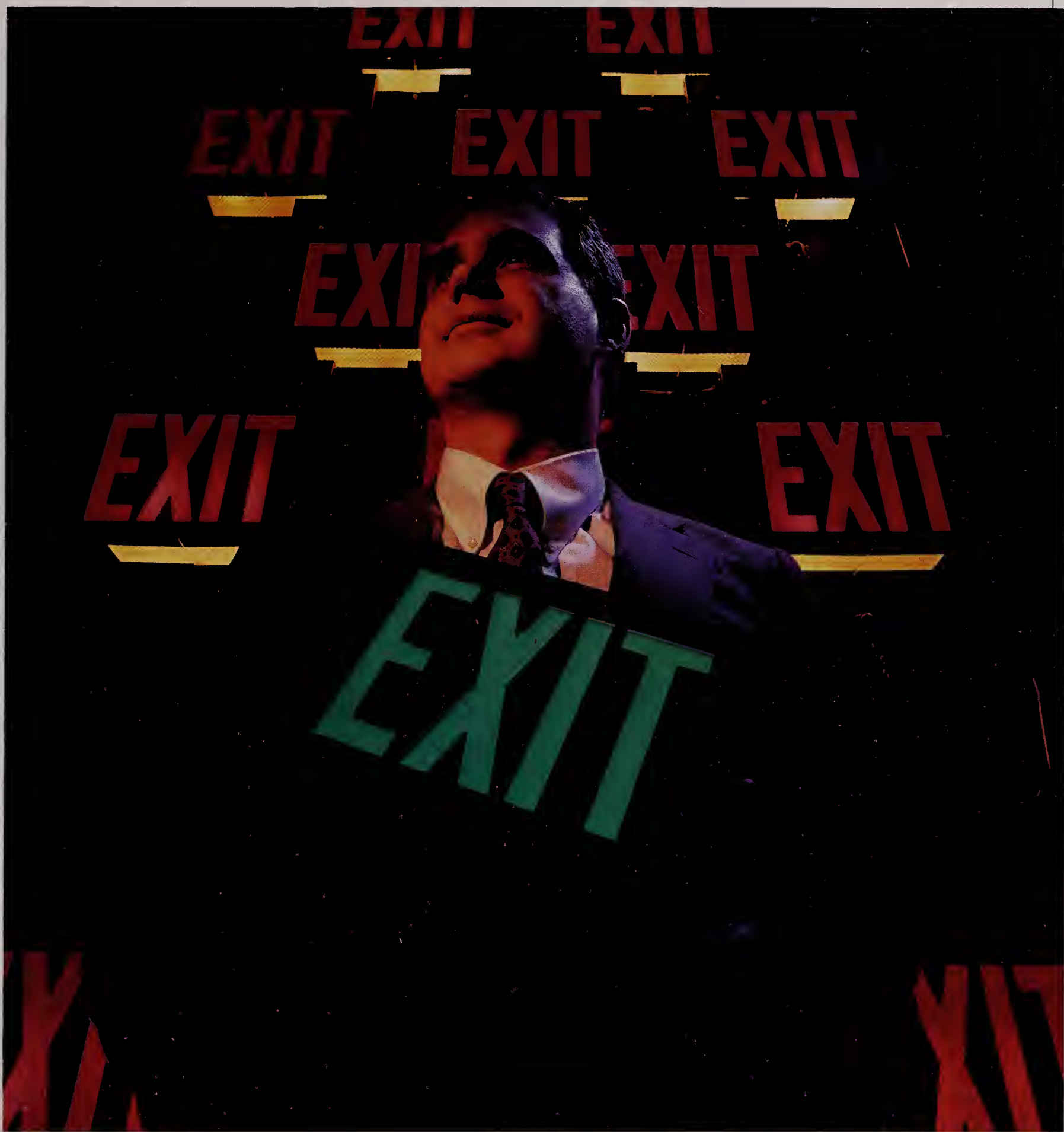
"New England is probably bottoming out because it cannot drop further. The upper Middle West, the Mountain regions and the Southwest have been doing well, as has the oil part of Louisiana. People are worrying about the Pacific Coast because of the housing difficulties. If [California] has problems, the rest of the nation will have problems."

plained Carlson, "you have product pockets of particularly severe spending limits and pockets of particularly high potential. No matter how bad the economy gets, people will still brush their teeth, and we do a tremendous business in toothbrushes and toothpaste; on the other hand, we expect to see some softening in high-priced luxury items. Our system lets us make sure that we have the right items in stock at the right price at all times, while keeping our inventories under tight control."

Despite the economic downturn, Carlson said he is moving ahead with plans to replace each of the stores' aging IBM Series/1 minicomputers with '486-based PCs running an enhanced restocking system. The new system will allow stock clerks to instantly access information on pending orders, thereby improving ordering decisions. "If a clerk looks at a shelf and sees there are only three items left, he won't have to wonder about whether or not more has already been ordered," said Carlson. "Making that kind of information available right at the decision points materially improves customer service by keeping items in stock, and [it] reduces inventory costs by avoiding unnecessary orders."

Carlson thinks the importance of these kinds of systems to making the best of tough economic times means that companies that are just now looking into them are too late. "I would hate to be approaching competitive times without being able to know what [our] customers are actually buying," he said. "I'd feel a little bit like a dinosaur that had been doing great when things were hot and humid, but now that it's getting sort of cold you have to wonder if you're really prepared to survive. The capitalist environment has a flavor of the cruelty of the Darwinian process."

Information technology vendors are feeling a bit of this cruelty as well. Digital Equipment Corp. in Marlboro, Mass., for example, is looking at layoffs for the first time in its history as IS executives put off hardware spending plans. But Information Systems Marketing Director



Pat Mullen insisted a recession may carry some good news as well, at least for Digital. "We're seeing people talking about budget cuts in the range of 10 to 20 percent," he said. "But a lot of forward-thinking CIOs are using this situation as an opportunity to make themselves more efficient by consolidating IBM main-frame data centers, and then taking part of the savings and investing it in

a new infrastructure." The goal of these investments, he added, is to be able to adjust more quickly to dips in the business climate or new opportunities by building a more flexible hardware and software platform. Digital, of course, would hope to get at least its fair share of such infrastructure spending.

That may not be a totally objective view, but many information technol-

JEFFREY KERNAN: "We're going after customer service, and we're going after it in a big way."

PHOTO BY SONNY WILLIAMS



If your company has gotten this complicated,

In any complex organization, size can create obstacles. And many firms are using information technology to help get past them.

But instead of trying to run

around obstacles, Andersen Consulting suggests that you eliminate them entirely.

Working from a total business perspective, we look for ways to

simplify your company's fundamental processes. We help you remove barriers between departments. Between individuals. Between your company and its business goals.



◀A

FOLD BACK SO "A" MEETS "B"



you should fold.

Then, after a clearer path has been established, we apply the information technology that will speed you on your way.

Using this combination of

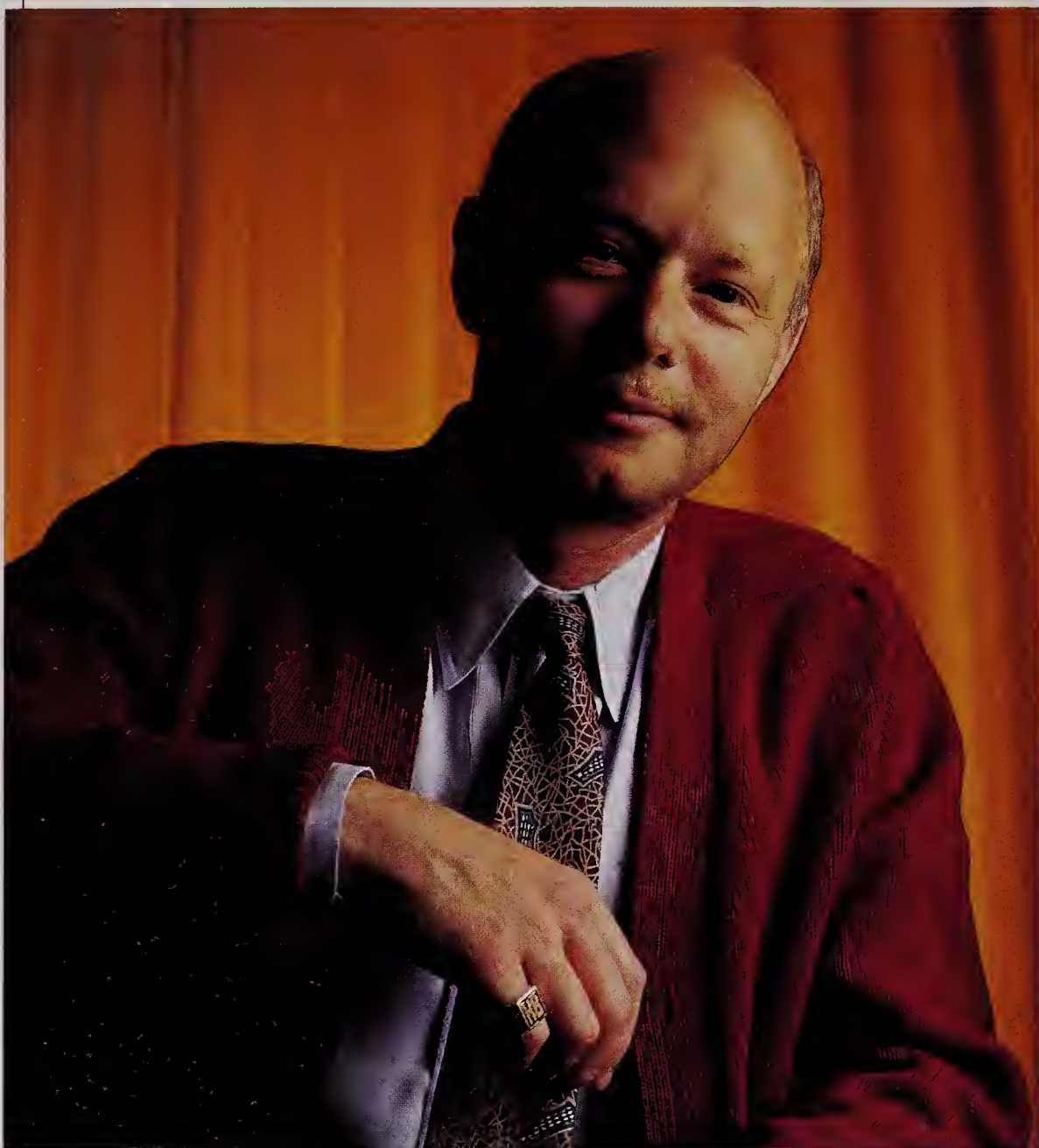
business and technological skills, Andersen Consulting has helped simplify operations for leading companies in almost every industry.

We invite you to join the fold.

ANDERSEN
CONSULTING

ARTHUR ANDERSEN & CO., S.C.

Where we go from here.SM



PARIS BURSTYN:

"The communications infrastructure [is] mission-critical."

Many information technology and communications vendors are seeing companies continue to invest in the face of a recession.

ogy and communications vendors are seeing companies continue to invest in the face of a recession, at least as long as the investment can be justified in hard dollars. Paris Burstyn, a market research consultant with the Business Research Group in Newton, Mass., said that many organizations are currently spending heavily on IT-related communications hardware

and software. "People are now viewing the communications infrastructure as mission-critical," he said. "They realize that if a system uses the network efficiently, the company will save a lot of money in maintenance and support." He noted that some companies with large customer-service or reservation centers, for example, are investing in ISDN-based networks that can automatically access a customer's data files in eight to 10 seconds less than has previously been required, allowing them to handle more calls without staff increases.

Some companies are not only resisting spending cuts, but are actually boosting their IT budgets. One of them is lighting distributor Lithonia Lighting in Conyers, Ga., which—like everyone else—is hot in pursuit of improved customer service. "We're looking at some areas where we can implement systems

that will achieve cost reductions, but that's not what we're focusing on," said Lithonia Vice President of IMS Jeffrey Kernan. "We're going after customer service, and we're going after it in a big way, especially in construction markets like Los Angeles that haven't softened up yet."

One key system Lithonia is rolling out, for example, will extend the company's network to warehouses and sales agents, in order to speed up and improve the process of getting price quotes out to the field. "Quotations are where the margins are in this business," said Kernan. "The speed with which you can move information around within and outside the company can make the difference between whether you get a piece of business or not."

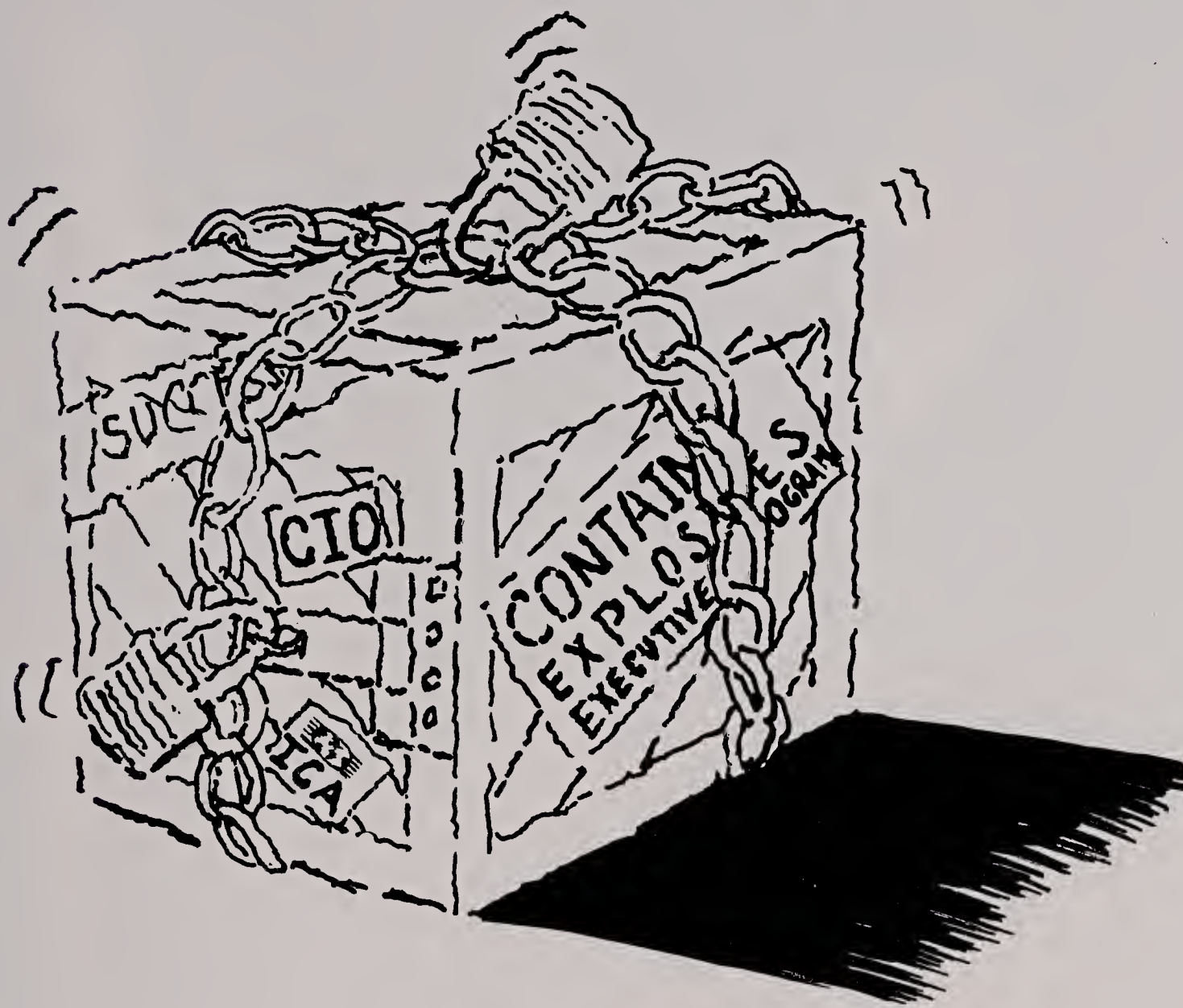
Kernan pointed out that Lithonia is not exactly averse to saving money, and he noted that he has scaled back plans to develop workgroup-based networks—plans that he doesn't consider essential to the company's goals at the present time.

"We're not in Utopia here, with everyone asking us to spend more money," he said. "But the word from top management is to get the important stuff done and out in the field where it can make an impression on customers. I'm not under pressure to squeeze every nickel, and I'm moving ahead with hiring plans, even though the company expects more than a mild recession."

If it were a lot more than a mild recession, Lithonia would start to rethink its position, conceded Kernan. "If things got real bad," he said, "we'd do what's necessary." So will everyone else, no doubt. But at least so far, it looks as if doing what's necessary won't turn out to be an intensely painful experience. □□

David Freedman is a freelance writer based in Brookline, Mass.

THIS BOX CONTAINS AN EXECUTIVE PROGRAM SO EXPLOSIVE IT HAS TO BE KEPT UNDER LOCK AND KEY!



Join other Fortune 500 executives whose companies spend an average of \$21.3 million on telecommunications equipment and services annually.

(Be a part of it on June 4, 1991)

For more information please call or write: International Communications Association at 12750 Merit Drive, Suite 710, LB-89, Dallas, Texas 75251 • 1-800-ICA-INFO (1-800-422-4636)

Co-sponsored by ICA and CIO Magazine



I.S. POINT MEN (from left to right): *Air Products and Chemicals* business analysts Roger Bast, Tom Collins and Ray Hoving



A PARTNER IS BORN

Up from the rubble of Fortress IS comes a new corporate hybrid: the 'business analyst,' who works as a member of a line department or business unit and illuminates ways of using IT to achieve business goals

BY PAUL KONSTADT

Information technologists have come out of their back-office IS sanctums and gone to work directly for managers on the front lines of the business wars. The practice isn't widespread yet, but at companies where IS professionals have been converted from isolated service vendors into full-fledged members of an operating team, the fruits of the effort have been substantial; programmers and developers have evolved into business analysts, with the ability to improve overall business results instead of simply providing technical solutions.

These conversion efforts have caused organizational conflict and required individual sacrifice and a sub-

stantial personal commitment from everyone involved. The process, however, has created new rewards, new challenges and new aspirations for developers and programmers. And it has led to better applications of information technology, which have in turn generated greater overall business success for the companies that employ them.

At the core of this change for technologists are a shift in perspective and a desire to expand professional horizons, according to Roger Bast, director of management information services for the industrial gases group of Air Products and Chemicals Inc. in Allentown, Pa. "My job is to contribute to the over-

PHOTO BY EUGENE MOPSIK

all business success of the group," said Bast, who is IS point man in his business unit and has reporting to him the leader of a front-line systems-development team. "I think there is a real thirst to get closer to the operation that runs up and down the [IS] line."

While the role of business analyst can offer IS professionals greater intellectual challenge, it also often presents new and sometimes daunting demands, according to Rosemary A. Evanoff, automation technology manager for the San Francisco regional office of Bechtel Corp., an international engineering and construction firm. "Reporting to the business units has put more of an onus on us to ex-

"The projects are going more smoothly. People are partners working together, not throwing sets of requirements across the wall, then tossing specifications back."

—Peter Mather

plain more," said Evanoff, now the primary IS contact for Bechtel's San Francisco-based engineers and project managers. "[That] may be painful, but it forces us to think spending through from a different perspective, which is good."

CIOs who oversee the broad use of business analysts say they have noticed stronger and more effective relationships between IS providers and senior business executives as a result. "It's been good for the corporation," said Chuck McCaig, senior vice president of corporate services at Mutual Benefit Life Insurance Co., of Newark, N.J. "There has been a closer bonding" between IS and line executives, he said.

When Opportunity Knocks . . .

.....
It's always a good idea to have people around who have a stake in the opportunity

At the Mutual Benefit Life Insurance Co. of Newark, N.J., June Drewry's role as a business analyst led to an IT-based re-engineering effort that has cut the cost of processing new insurance applications by 40 percent and speeded up application processing fivefold. Had technologist Drewry still been working in her old centralized IS department instead of tackling business problems alongside Senior Vice President Keith Glover, those benefits might not have materialized. "[This re-engineering] would not have been possible without technology as a part of the solution," Glover said. "[And] without an IS person actively participating in the process,

I don't think we could have done it."

Theoretically, the same results might have been achieved in a more traditional IS setting, Glover continued, but because Drewry and her team were members of the business unit rather than outsiders looking in, their participation took on added zeal. "We had people who were eager to work on the problem," said Glover. "It was their problem too."

The seeds of the undertaking were planted during a casual conversation that accompanied Glover's request for a system to deal with a new insurance policy. Drewry suddenly felt that she needed a clearer mental picture of exactly what happened when a new policy application came in the door, and Glover, instead of merely diagramming the process, gave her a tour of the physical facilities. Drewry saw rooms crammed with various mainframe terminals, sundry word-processing systems, printers and other paraphernalia—the result of introducing a dedicated mainframe system, with its own unique data structure, each time the company added a new product family. She also saw that in practice, the writing, printing and mailing of policies and related correspondence were an integral part of the process, not sidelines to

the mainframe systems.

With that image of near-chaos in mind, Drewry realized that what was needed was not just another new independent system with its own corps of specially trained operators. Instead, she created an integrated order-entry and control system to act as a front end for all new and existing systems.

Drewry's creation uses standard screens to prompt operators for all germane new policy information, then automatically puts that information into the form needed by the system handling that policy. With the technology in hand, Glover was able to retrain operators and end duplication and waste, enabling his organization to process many more policies with the same number of people.

"Only by looking at it as one piece could I see that this is how we do our work," Drewry said. Without her perspective as a business analyst, she continued, "they could have been forced to deal with separate technologies forever." Glover agreed. "[The re-engineering project] was owned by both parties from the beginning, [and the business-analyst] structure made it a lot easier."

—P. Konstadt

Peter Mather, vice president of management information services at Air Products, found the same thing to be true at his company. Moreover, he said, "the projects are going more smoothly. People are partners working together, not throwing sets of requirements across the wall, then tossing specifications back."

Business-unit general managers who oversee IS people in the business-analyst role have found benefits as well. Said John Hoffman, senior vice president for individual administration at the Pacific Mutual Life Insurance Co. in Newport Beach, Calif.: "The response from the programmers is much better, [and] we get our new products out faster now. They understand that we're in the business to sell insurance, not to do systems."

Keith Glover, senior vice president for individual insurance administration at Mutual Benefit, is equally pleased with the new arrangement. "Our IS people are [now] active participants looking at the problem that the business is trying to solve." That, he said, is in sharp contrast to the former arrangement. "Problems didn't get solved. The systems people didn't understand business issues, and the business people didn't understand the opportunities technology could offer them."

That last point has been a long-held and widely articulated criticism of centralized information systems organizations. In fact, Weyerhaeuser Corp., a forest-products giant based in Tacoma, Wash., refocused its IS organization in 1985 explicitly to combat the perception that IS is remote and cumbersome. "My own sense is that there was a feeling on the part of the business that [IS] was too far out of reach," said Susan Mersereau, vice president and general manager of Weyerhaeuser Information Systems (WIS), the firm's corporate IT subsidiary. "We were breaking up the corporation into smaller units with local control, and the technology really just followed it."

Executives who have overseen the



A BONDING between IS and line executives June Drewry, Keith Glover and Chuck McCaig

transformation of information technologists into business analysts say that rewriting job descriptions and redrawing lines on organizational charts are just the preliminary steps in a long and complex process. To get started, technologists often need an education in basic business processes and values, while operating executives have to learn a new vocabulary, new procedures and new perspectives. After those basic understandings are reached, myriad small adjustments are needed to resolve differing expectations about pay, promotion and benefits.

The first step for most analysts is to learn more about the business processes for which they are creating systems. The primary sources of business-specific information include new coworkers, trade publications and reference books, and for some, experiences garnered during previous development efforts. Proximity to corporate customers accelerates

the learning process. "Simply sitting next door to people allows the quantity of interaction and the quality of interaction to increase exponentially," said Air Products' CIO Mather. "They get drawn into meetings, drawn into discussions simply because they are there."

Bridging the cultural gulf between IS and operations is a more enigmatic element of that learning process. People on each side often have different work styles and professional languages, which can cause some testy personal exchanges. "It requires a lot of listening," said Ray Hoving, a group MIS director at Air Products. "I wanted to make [my new associates] understand that I was changing the way things were done in the past. I did not come to the group to be the defender of the IS culture; I came to understand the process systems group culture and to establish a merger of the two."

Inevitably, front-line technologists

PHOTO BY JOSEPH BERGER

Their Open Systems promise.



Which looks better to you?
More blue skies. Or fast delivery of real Open Systems.

If it's hardware and software you want, there's a computer company ready to supply them.

Hewlett-Packard.

In fact, we'll make it this specific. If you're planning to

add a system to handle a new strategic application, call us.

We'll deliver a computer solution that will tackle the immediate task. At the same time, it will integrate with products from other vendors, with other platforms, operating systems and applications.

Key to making this work is our

broad range of systems software technology. For the people in your company, this brings point-and-click simplicity, while allowing transparent integration of applications and access to data bases, both local and remote.

This Open Systems reality has a solid foundation. Six years

Ours.



of delivering standards-based systems. A dedication to networking standards, from LANs to WANs. And a family of RISC-based computers offering unmatched scalability from desktop models to multi-user systems.

For nearly twenty years, we've been delivering computers

to handle company-wide strategic functions. From materials management and financial analysis to office automation and distribution. And we offer service so superior that, in the Datapro User Surveys, HP has achieved the best overall record among industry leaders for cus-

tomers support satisfaction. For seven straight years!

In short, there's nothing 'blue sky' about our Open Systems. Call **1-800-752-0900**, Ext. 1947. We'll deliver.



**HEWLETT
PACKARD**



COLIN FODEN (left) and **JOHN HOFFMAN**: *The new relationship requires a period of adjustment.*

find that their business-unit colleagues want evidence of their ability to add value to the business process. The first and often simplest way for a business analyst to prove him- or herself is to provide useful systems quickly; that neutralizes any general skepticism about the promises of IT. It has proven to be more difficult to dislodge the deeply embedded financial and cultural stereotypes held by some upper-echelon executives. Bast

at Air Products said that accounting for IT continues to be a problem. "MIS is still typically viewed as an overhead function," he said, "[so we] have to keep showing them where [we] make a contribution."

Bob Zook, director of information management for Weyerhaeuser's forest products unit, added that disparate cultures can impede personal communication. "Just as having business skills [did not come naturally] to

us, an understanding of information technology is not natural to business managers," he said. Language can be a problem, Zook continued, particularly with senior executives who started their careers before PCs became a standard tool in business schools. "If we talk computerese to these people, we are not going to be allowed into their councils."

Business-unit general managers report that they, like their new IT-

providing subordinates, have to go through a period of adjustment before they can profit from the new proximity of IS and operations. At Pacific Mutual, Senior Vice President Hoffman found himself spending a lot of time explaining basic business principles to his IS people, things like the need for speed and flexibility in the hotly competitive insurance marketplace. "We went through a great deal of pain talking to people to get them to understand what the business was about [because] they really had no business sense," he said. For example, new programmers would often complain when he told them to change their development priorities because the market had shifted. As a result of Hoffman's teaching efforts, he said, programmers now "understand why priorities change," and he believes that this leads them to produce new designs more quickly.

For Mutual Benefit's Glover, on the other hand, the adjustments were more personal. "The first few times I came face-to-face with technology, . . . my reaction was defensive," he explained. "I am more intuitive, while the typical IS person is more analytical. I sometimes drive them crazy, and they sometimes drive me crazy because of the [different ways] we think about problems." It took efforts of will to overcome these stylistic frictions, Glover continued, but having reached accommodation, "I can't imagine going forward in the future without an IS person at my side."

The broad themes of learning new jobs and negotiating new relationships are not the only ones in the ongoing dialogue between re-focused IS analysts and their new line managers. Such mundane matters as defining career paths in a dispersed organization and providing funding for continuing education have had to be rethought, and in some cases, argued back and forth. A bone of contention between IS and line executives has been continuing education, a costly item that is a staple for IS executives, but one that line managers rarely have had to provide. "I'm not certain that some line managers have

understood the amount of training needed" to stay abreast of changing technologies, said Colin Foden, the Pacific Mutual second vice president of information technology planning who oversaw the company's complete dispersion of IS. Countered Hoffman, "Some of it was excessive, but at the same time [they] made a strong case for some training, so I think we're OK now."

An underlying organizational assumption of business analysis is the

A bone of contention between IS and line executives has been continuing education, a costly item that is a staple for IS executives, but one that line managers rarely have had to provide.

dispersion of supervisory authority over IS to individual profit-center managers. That decentralization, however, is not universal, because many companies preserve a corporatewide IS structure in order to allow their business-unit-based analysts to find peer support and career opportunities outside their current postings. "We don't want to build small, inbred groups of thinking, [but rather to] maintain a large creative community," said Tom Collins, MIS director of the chemicals group at Air Products. "We force our new hires to work with at least two MIS directors [in order to] get to know a larger number of their peers."

With the same view toward collegial idea-sharing and career mobility among business units, Bechtel's field IS managers report primarily to a

business manager and secondarily to a corporate-level information executive. They are also given a forum on the corporate data network, said IS manager Evanoff. "We still have a functional tie to IS," she said. "We have lots of shared information [such as] day-to-day electronic-mail discussions of common issues . . . and opportunities for improvement." Evanoff's own career illustrates the scheme. She was hired by Bechtel as a systems analyst in London and rose to the position of data processing manager there before being transferred to headquarters in San Francisco to do strategic automation planning. She took her current position directing IS efforts in the Bay area regional operating office after a number of line and staff IS assignments at headquarters.

Changes in the way IS compensation is calculated have served as a clear reminder of the deeper changes being made at many organizations. Salaries, as such, have not generally been cut, but ground rules have been altered in order to reinforce the change from a technology to a business focus. Explained June Drewry, an applications development executive at Mutual Benefit: "My compensation is now based on profitability of the profit center; their profit is our profit. If the business makes a big hit, it hits our pocketbooks too. But if we are nothing but an expense, that hits our pocketbooks adversely."

The long and laborious process of making IS providers more responsive to business-unit requirements and more capable of producing solutions with readily exploitable business value has brought benefits hailed by both IS people on the front lines and the general managers who direct them. But the gains have carried a price that those involved might have preferred not to pay.

The personal experiences of Air Products' Bast are typical of those described by other analysts. The first thing that struck Bast after his changeover was the substantial difference in managerial cultures between

From Business Analyst to Business Leader

.....
One pioneer parlayed his IS background into a corner-office posting

Serving as the bridge between IS and operations proved to be a winning career strategy for William L. Ferris, chief executive officer of the PM Group Life Insurance Co., a subsidiary of Pacific Financial Company of Newport Beach, Calif. In fact, Ferris took his first posting as a business analyst decades before that term became grist for the guru mill—back in 1965 when he was a

24-year-old actuarial assistant still in Pacific Mutual's training program.

"We were rotating all our actuarial students through the information system area," he recalled, "and I moved over during a major redevelopment of systems within the individual insurance product line." Ferris said that temporary assignment evolved into his first IS bridge position, as actuarial assistant for systems development. This in turn "... led toward a shift in career direction where I finally assumed responsibility for the entire corporate systems area." Ferris confided that "I moved in and out of data processing to a far greater extent than I had planned for, [and] really wondered if I would ever get back into insurance," but those doubts disappeared when he became general manager of the group insurance operation in 1985.

Ferris's IS experience has been a valuable career asset because information technology is such an important part of the insurance industry, he said. It also gives him a personal competitive edge in the executive

suite. "Computers and technology are a little scary to a lot of general managers who have not had exposure in this area," he said. The knowledge he has gathered from his own wide range of assignments has convinced him that an eclectic track record may be priceless. "I'm a great proponent of moving people around in the organization. It's something that looks very expensive at the time you're doing it, but in the long term has a great cost-benefit relationship."

Ferris warns technologists who would follow him up the executive ladder not to rely exclusively on their technical knowledge because "it's always changing" and will lose half of its value in "something like three years." Instead, he said, they should "... have a very open mind about alternative directions and try to do as many different things as [they] can."

"I'm always disappointed when I see an associate offered a good opportunity and, because it is a lateral move, will turn it down."

—P. Konstadt

the consensus style of IS central and the top-down, action-oriented mode of his new home in the industrial-gases group. "It was quite a shock, but I had to work on it," he said. Under the old regime, Bast's development team would not consider a project ready for use until it was perfect, with only fleeting regard for how long that might take. Now, he said, "as I move into the faster-paced business world, I have to be prepared to put [a new system] out there quickly, then clean up any debris later. That's a cold, hard reality, [a] general cultural change that we're still dealing with."

Collins, Bast's counterpart at the company's chemicals group, found the same trade-off. "The pace of the decision-making and the desire to get the job done meant ... a shift away from technical elegance," he said. Similar forces are at work at Pacific Mutual, according to Foden. "Strate-

"I thought it would be a challenge turning IS people from slaves to partners, but it hasn't turned out to be nearly as painful as we had thought. Some of them said, 'Thank God! We're allowed to think again.'"

—June Drewry

gic business units have a tendency to be bottom-line, short-term driven."

Just as individual programmers and analysts have had to live up to an almost Faustian bargain that forced them to sacrifice technical perfection on the altar of speed, some organizations that moved early to decentralize IS decision-making authority have since found that a stronger central direction needs to be set. At Weyerhaeuser, for example, executives are concerned that allowing IS to become too committed to an immediate response to users' demands has forced them to give up some of the benefits of integrated enterprisewide solutions.

"Most of the issues surround what I would call the technical architecture," said WIS General Manager Mersereau. She pointed to a number of developments that might signal a need for stronger central direction: a

proliferation of databases, inconsistent data management and a multiplicity of hardware platforms. "There have been increasing concerns over the multiple skill mix associated with all of the technologies we are supporting at this time," she said. "As we see the company becoming increasingly interconnected through PC LANs and wide area networks, [we] need to take a more strategic look as to where we are going."

Mutual Benefit CIO McCaig has also started to see enterprisewide problems crop up in the planning and execution of new systems. "There is,

in my opinion, a slight degradation, a little less efficiency than there used to be," he said. "The longer-view projects don't seem to make it to the top of the priority list. We're doing the more urgent projects rather than the most important ones." To compensate for both the technical lassitude and the strategic losses, Mutual Benefit's senior management team has moved to reassert some central control over applications development. "We felt we had drifted a little too far," McCaig said. "We jointly initiated and jointly support a project that imposes some development stan-

dards and tools. That has started to correct [the] drift."

There was at first some chafing from Mutual Benefit developers who felt that they had been deprived of the highly prized professional auton-

*"You can't win
at this game
by yourself.
It has got
to be a
team effort."*

—Keith Glover



BOB ZOOK and SUSAN MERSEREAU: Bringing IS back within reach

omy of the centralized IS era, but McCaig said that most have now acquiesced. The strictures of the new development regimen, he added, have been eased by "new, fully equipped, super-deluxe system programmer workstations." The result, he believes, is that Mutual Benefit is getting better systems than ever before. "I'm not saying we will [always] build better applications" with the hybrid of a centrally guided, business-unit-based development organization, "but on average, we will."

From both sides of Mutual Benefit's organizational aisle comes testimony to the value of the approach, but also what proved to be new and startling personal insight. "I thought it would be a challenge turning IS people from slaves to partners, but it hasn't turned out to be nearly as painful as we had thought," said systems development executive Drewry. "Some of them said, 'Thank God! We're allowed to think again.'"

Glover, to whom Drewry reports, had his own revelation: "To fully appreciate the benefits or opportunities technology offered, I had to really make an investment myself. I couldn't just rely on IS to come and hand me solutions. You can't win at this game by yourself. It has got to be a team effort." ☐

PHOTO BY RAYMOND GENDREAU

Presenting All The Systems Software You'll

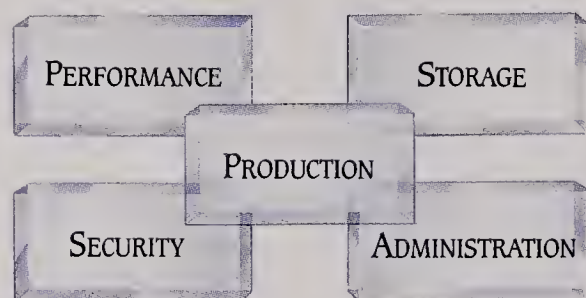
It's going to be quite a decade.

Every employee, every department, every division will be expected to do more—with less. Including the data center.

Especially the data center.

Demand for improved user service will reach new highs. Budgets and available resources will shrink. To succeed, data center managers will need to do the inevitable.

Automate.



Only CA-UNIPACK solutions enable you to automate entire functional areas of the data center. Working together they deliver the ultimate in data center automation and service level performance.

Automating data center operations is the key to delivering the service levels businesses need to compete in the 90s. And that's why so many companies are turning to us. Over the years we've helped thousands of clients automate their data center operations and today according to Computer Intelligence, we offer more data center software solutions than anyone else in the world.

While hundreds of niche vendors each offer a few discrete products, our CA-UNIPACK® solutions can automate entire functional areas of the data center such as Production, Storage, Security, Performance Management, and Data Center Administration.

And now, with our new Computing Architecture For The 90s, the levels of integration and automation have been raised even higher. By sharing information and common services, the individual CA-UNIPACKS work together seamlessly



CA's Computing Architecture For The 90s protects and enhances the value of every CA software product.

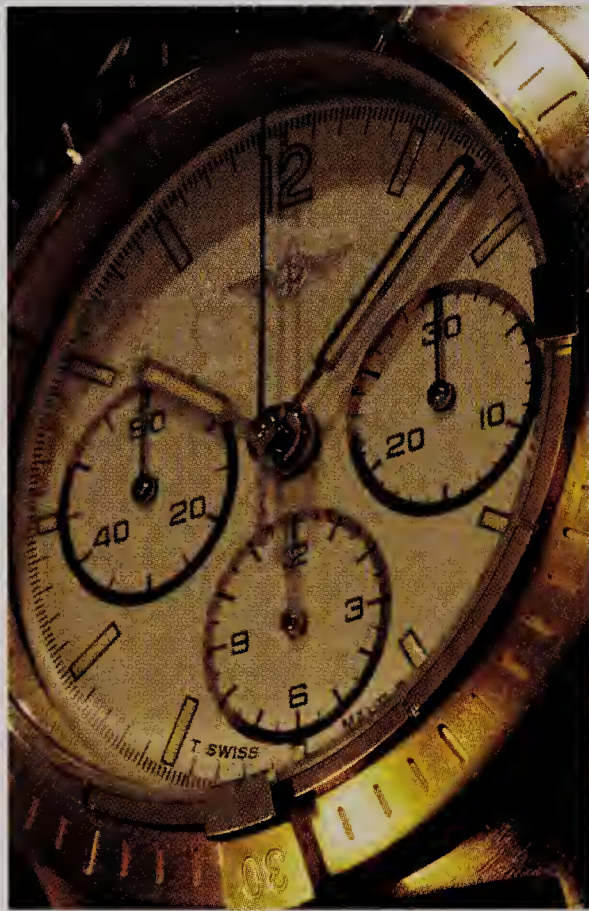
across multiple operating systems and hardware platforms.

The result is consistently higher levels of service. Improved response time. Investment protection. Maximization of personnel and hardware resources. And ultimately a new breed of data center.

A data center that enables you to play a critical role in helping your enterprise compete and succeed in the 90s.

One of the most critical areas of data center operations to automate is production. We can help you automate all of it with one single step:

Production.



CA-UNIPACK®/APC—Automated Production Control.

It's the most advanced, and integrated package in the industry today and is currently used in thousands of MVS, VSE, and VM data centers around the world.

CA-UNIPACK/APC covers every aspect of automating production control processes including: automatic workload scheduling, automatic console message processing, automatic rerun/restart, automatic report

balancing, automatic report manipulation and distribution, JCL validation and automated job recovery.

CA-UNIPACK/APC integrates with other CA-UNIPACKS including the industry's most comprehensive, multimedia solution for system-managed-storage (SMS) and non-SMS environments:

Storage.



CA-UNIPACK®/ASM—Automated Storage Management.

It's by far the best way to maximize your investment in storage and resource management. Unlike IBM's solution, CA-UNIPACK/ASM works in both SMS and non-SMS environments, and addresses both tape and DASD management.

Some of the benefits include: automated tracking of tape library inventory, early warning and recovery facilities, DASD performance measurement, chargeback, destruction protection and automated volume cleanup.

It's the most effective solution for managing both tape and DASD resources.

Systems Management Need For The 90s.

CA-UNIPACK/ASM integrates with other CA-UNIPACKS including the most advanced security control and audit software in the world:

Security.



CA-UNIPACK®/SCA—Security, Control and Audit.

It offers you a secure, protected environment across multiple hardware platforms, operating systems and wherever your distributed processing takes you including MVS, VSE, VM, VMS, networks, DB2 and PC/DOS.

CA-UNIPACK/SCA gives you access control, VTAM network control, network session management capabilities and an automated approach to reviewing operating environments.

It also integrates with other CA-UNIPACKS including the most comprehensive performance management and accounting solution ever developed:

CA-UNIPACK®/PMA—Performance Management and Accounting.

CA-UNIPACK/PMA's integrated approach includes: comprehensive online performance monitoring and

Performance.



historical reporting, expert system technology, resource accounting, chargeback, consolidated reporting and capacity planning.

This software solution also integrates with other CA-UNIPACKS including an automated, comprehensive approach to data center administration:

CA-UNIPACK®/DCA—Data Center Administration.

This integrated solution covers all aspects of data center administration including: inventory management, change management, configuration management and asset tracking.

It can help you produce instant and accurate network availability information. Quickly assess the impact of network failures. Produce current inventory reports. Provide consolidated reporting from multiple platforms such as IBM, Digital and PC's. Cut your vendor reconciliation time in half. Negotiate better maintenance contracts. And do many other administrative tasks that manual, error-prone methods simply

Administration.



cannot handle.

Every one of these CA-UNIPACKS is supported by CA-UNISERVICE®/II. This unique service and support system offers you a direct link between your mainframe and CA's Customer Service around the clock—and around the world.

Altogether, these CA-UNIPACKS can help you create the most productive data center possible.

A data center that's ready for the 90s. For more information on CA-UNIPACKS and all the Systems Management Software you'll need for the 90s, pick up the phone and call 1-800-645-3003.

It could be one of the last manual tasks you do.

And the most productive.



© 1990 Computer Associates International, Inc.,
711 Stewart Avenue, Garden City, NY 11530-4787.
All trade names referenced are the trademarks or
registered trademarks of the respective manufacturer.

FROM BIG BANG TO BIG I.T.

Arno Penzias won the 1978 Nobel Prize in physics for identifying the remnants of the cataclysm that formed the universe. Now he says that information technology is "where the action is"

Arno Penzias hasn't exactly lowered his sights. But the universe in which he toils has narrowed from the cosmos to the world of information-technology research and development. By training, he is a radio astronomer who won his own research stripes (and the 1978 Nobel Prize in physics) by identifying the still-vibrant remnants of the Big Bang that formed the universe some 15 to 20 billion years ago. But now he is an information technologist, the top scientific overseer (vice president of research) at AT&T Bell Labs, in Murray Hill, N.J., the institution where such basic IT building blocks as the transistor, the laser, the charge-coupled device and the UNIX operating system were born.

"Information technology . . . is where the action is," said Penzias.



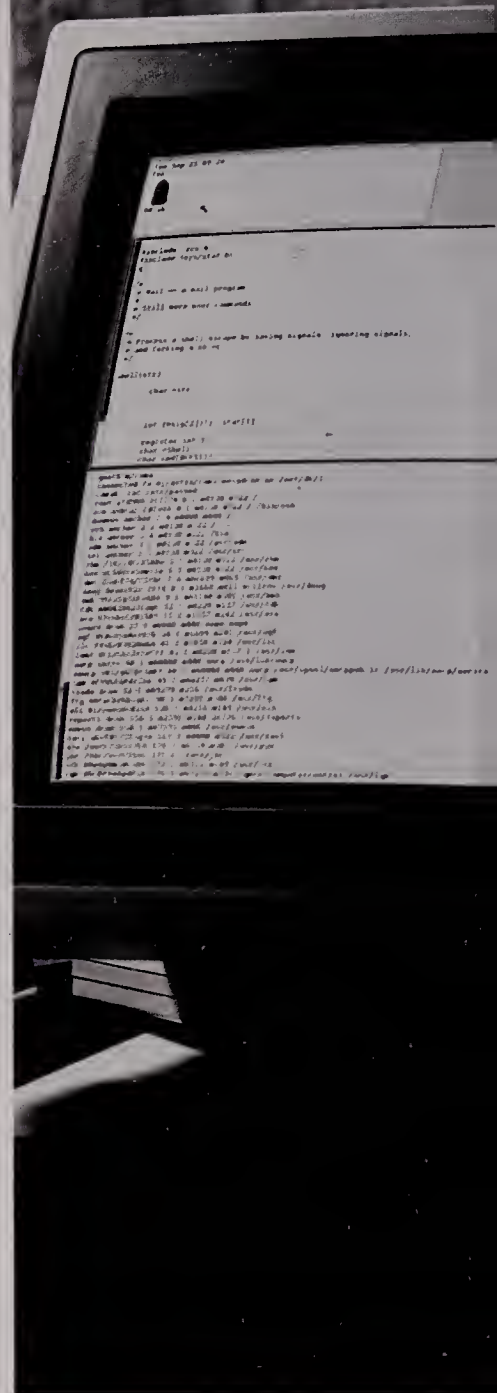
And at Bell Labs, he is well positioned to assess the future of IT.

It is a future where digital image processing and storage will be commonplace, Penzias believes, while voice and text will be readily understood by computers. This will enable the oft-promised technology of electronic filing cabinets to finally

bring order out of the chaotic mass of information on paper. In addition, Penzias predicts, fiber-optic cables will displace the aboriginal technology of twisted-pair wire throughout the telecommunications network, bringing about the inevitable merger of voice and data into a single network architecture—one, he says, that will most likely evolve from the existing voice network.

Of those developments, perhaps the least dependent on new technological breakthroughs is the ascen-

BY PAUL KONSTADT



ARNO PENZIAS, accepting the 1978 Nobel Prize

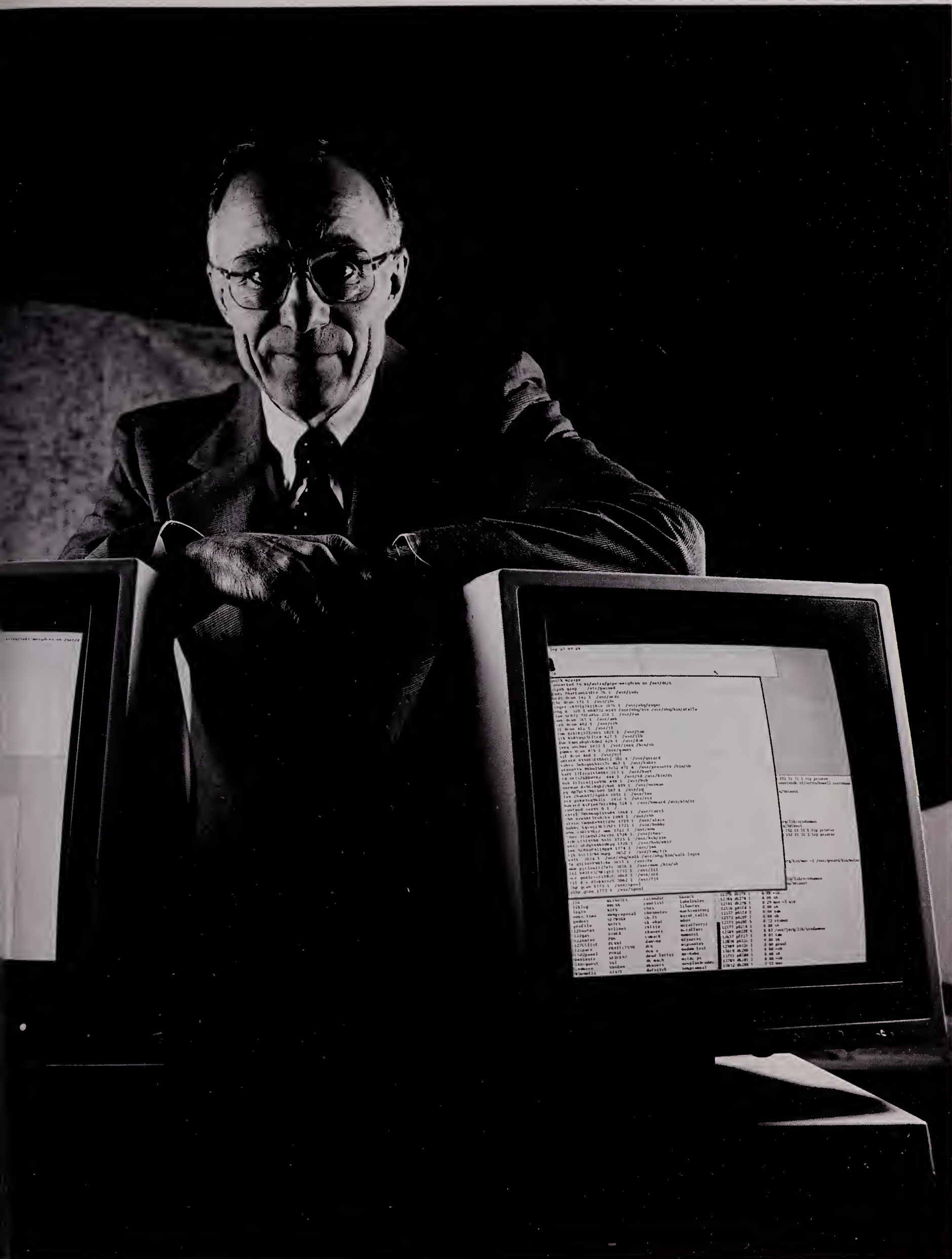


PHOTO RIGHT BY PAT HARBON; PHOTO LEFT COURTESY OF BELL LABS

size in physics from King Carl XVI Gustav (left), and at AT&T Bell Labs (above), where he presides over IT research and development.

dancy of imaging. "It's an explosion waiting to happen," Penzias said. For one thing, imaging pioneers like Citicorp, American Express and the Los Angeles County court system have demonstrated track records of usage. "There are a few places where people have two-, three-, five-million documents online, and they pull two, three thousand an hour, and the thing really works!" For another, Penzias continued, the substantial cost of big-city office space has made the electronic storage of an image significantly cheaper than the storage of paper. "You're talking about a one-year payback," Penzias said; "it's a no-brainer for many banks and insurance companies."

Pattern recognition—the information processing technology that in essence enables computers to hear and to see—will be the source of a new family of applications, according to Penzias. Systems that can translate discrete spoken words into machine-understandable form exist now, he continued, but in general, these systems still have difficulty when presented with a wide range of individual accents, speaking styles and tones of voice. Penzias said that Bell Labs has developed a device which can deal

"The fact that the pieces [of the electronic filing cabinet] are available is like flypaper for engineers and venture capitalists. The performance in real situations is harder to achieve than most people think."

—Arno Penzias

Fostering Innovation

Arno Penzias's recipe for the effective management of a fast-paced, innovative, technology-driven organization starts with a simple premise: Teasing is always counterproductive

If I were king, if I could impose an action on the world of business, I would stop all teasing," said Arno Penzias, vice president of research for AT&T Bell Labs. In many organizations, teasing and kidding are used as a social lubri-

cant, but Penzias said his experience has taught him that such humor is more often "a method of group censorship" that undercuts the self-confidence needed for creativity and experimentation.

"If we really expect people to act in confident ways, we have to help them build confidence," he emphasized.

Penzias started his Bell Labs career as a radio astronomer looking for clues to the origins of the universe. He made the transition from hands-on research to management in 1976 when he was promoted to director of the radio research laboratory. "The part that's hard, and it's hard for everybody, is [developing] the kind of relationship you need with other people so that they can do their part of the work without your over-controlling them. [You need] the feeling that other people can really do their jobs as well as or better than you. That's the hard part, and I don't know if I

with pre-selected words or phrases from almost any speaker, one which could be in general use by the middle of the decade. "We are showing such things to key customers, [and] we are looking at it ourselves for a product where it makes sense," he said.

Machines that extract meaning from complete spoken sentences appear to be less imminent. Bell Labs' researchers have created a system that can pick out essential information from conversational statements, rather than menu-prompted single word responses, and they've used it to craft an experimental automated system for making commercial airline reservations by telephone. But the Bell Labs demonstration requires a custom-designed mini-supercomputer just to deal with the 132-word vocabulary needed for that particular routine transaction, and the system can be stymied by halting speech, broken syntax and non-standard pronunciation. "The big thing is that we are going to be able to use our voices more than we have in the past," Penzias said.

Pattern-recognition research has

already taught computers to read standard type styles, and even block printing, using well-established optical character recognition [OCR] technology. Eventually, said Penzias, it also promises to teach computers to see—to read engineering blueprints for example, or to identify any particular object in a photograph. That power has tantalized researchers not only in office IT, but in robotics and factory automation as well, but Penzias cautioned that there are high technological hurdles yet to be cleared before machine vision can become a useful part of commercial systems. "Our ability to analyze images [is] certainly a decade or more behind where speech recognition is," he said.

The third significant new IT application Penzias foresees—the electronic filing cabinet—is more an innovative assemblage of already established technologies than a fresh weapon in the IT arsenal. The necessary hardware elements—powerful desktop processors supported by cheap mass-storage capability, scanners and a variety of output de-

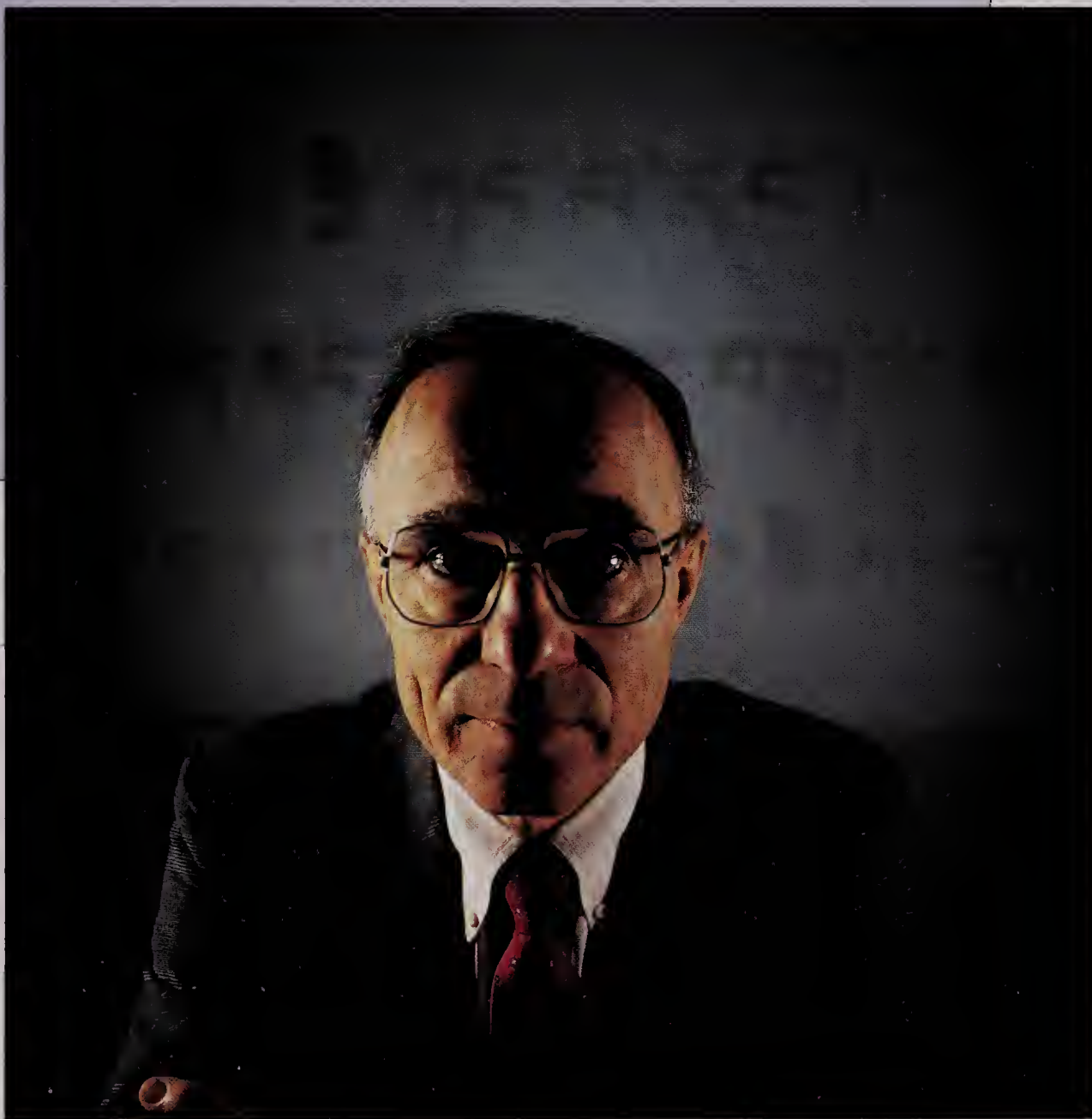
learned it."

Penzias found that his office furnishings could help the process. Early in his managerial career, he swapped the standard desk for a conference table, so that anyone who came to see him could sit as an equal. When a promotion took Penzias to a new office, a colleague who had seen how effective Penzias's office style was asked him for his old furniture. "It was probably the most flattering action I can remember in

my years as a manager," Penzias recalled.

It is easy to spot a well-managed technical organization, Penzias said. "The good places are those where being brighter than the people around you is thought of as a plus, [and] the best favor you can do for somebody . . . is to allow them to hire a person who is smarter than they are. . . . Where you have that situation you get excellence."

—P. Konstadt



ARNO PENZIAS: *The long-promised computer-integrated office is on the verge of becoming a reality.*

vices—have been on the market for years, but it has proven almost impossible so far for developers to integrate them into a functioning whole. "The fact that the pieces are available is like flypaper for engineers and venture capitalists," said Penzias—first attracting them, then entrapping them in failure. "The performance in real situations is harder to achieve

than most people think."

The reason, according to Penzias, is that the underlying software has been hard to work out. To illustrate the scope of the problem, he suggested visualizing a worker's desk the first day on a new job. "With no files, you can leave everything on your desk, and you have all these wonderful empty buffers. . . . But by

the end of the fourth year on the job, [the buffers] are all filled, and you can't find anything. I think that's why people change jobs: because they get to throw out all those files."

Searching and indexing technologies are advancing, however, and Penzias expects that remaining problems will be solved in the near future.

On the communications side of information technology, Penzias expects that "pretty soon" laser-light-carrying glass fibers will start sprouting in all directions from AT&T PBXs, connecting the central switching computers to the telephones on users' desktops. "In some cases, it makes more sense to switch light than it does to switch electronics, [and] since we have access to those technologies, we want to do it in ways which preserve the customer's investment." By investment, Penzias means the intangible things like the knowledge base of how to make the system work. "You can afford to change your hardware; you can't afford to change your calling habits . . . how to dial [and so forth]."

With the telephone destined to provide a desktop front end to a high-capacity fiber-optic pipeline, Penzias expects the telephone network to become the data highway of choice in the future. "Just as you use your keypad today to call up your friend, you [will be able to] use your keypad on your Definity [an AT&T-made telephone system] to connect an optical fiber between two places. It's the cheapest way of doing it in terms of programming costs, and that's the only thing that counts." To illustrate the importance of connection convenience, Penzias pointed to the continued use of fax transmission among people who are also linked by a dedicated data network. "You've got a lot of people who send faxes instead of

PHOTO BY PAT HARBON



Enroll in
CIO
Conference

CIO Magazine Announces...

Perspectives:SM
**Maximizing Profits
Through
Information Technology**

Amelia Island Plantation
Amelia Island, Florida

Sunday, March 10
through
Wednesday, March 13, 1991

For general managers and technology executives, the strategic management of Information Technology will dictate your company's financial health, if not survival.

That's why CIO Magazine has developed a three-day conference designed to address the alignment of Information Technology, strategic business goals and corporate profits.

Perspectives will examine the relationships between financial vigor and information resource management. Through general sessions, interactive breakout meetings, one-on-one dialogues and informal discussions, participants will see, hear and talk with experienced, professional leaders and pioneers in the correlation of dollars and data.

Among the presentations...

CIO
Perspectives:
**Maximizing Profits
through
Information Technology**

CIO Magazine Invites You To Attend *Perspectives*SM: Maximizing Profits through Information Technology

A three-day executive conference addressing
today's most critical business issues.

**Sunday, March 10 – Wednesday, March 13, 1991
Amelia Island Plantation • Amelia Island, Florida**

For more information or to register, complete and return this
postage-paid card. Or call **1-800-343-4935**.

Ask for Lori Cardarelli or Diane Martin.

- ☐ Please send conference information.
☐ Please register me and bill my company.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ FAX _____

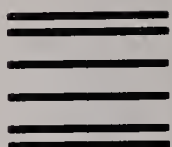
Spouse (if attending) _____

Early registration is recommended, as conference space is limited.

Perspectives is a service mark of CIO Publishing, Inc.



THE MAGAZINE FOR INFORMATION EXECUTIVES



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1020 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

CIO Magazine
Attn: Conference Department
P.O. Box 9208
Framingham, MA 01701-9900



- 
- **John Donovan**, *Cambridge Technology Group*, on Aligning Systems with Critical Success Factors
 - **Paul Strassmann**, *Strassmann, Inc.*, on Measuring IT's Relationship to Profitability
 - **Bryan Shepherd**, *Computer Associates International*, on Protecting Investments While Optimizing the Software Development Process
 - **Mary Margaret Gibson**, *Channel Strategies, Inc.*, on Multivendor Solutions... Internal versus External Systems Integrators
 - **Ray Cairns**, *Du Pont Company*, on the Scope of the Billion Dollar IT Budget
 - **Al Malabre**, *The Wall Street Journal*, on Business and the Economy Plus...
 - **Roger Fisher**, *Harvard Negotiation Project*, on Negotiation Strategies
 - **Richard Schroeder**, *Malcolm Baldrige Quality Award Senior Examiner*, on the Cost of Quality in an IT Environment
 - **John White**, *Texas Instruments*, on the CIO Responsibility
 - **Mike Behar**, *University Communications Inc.*, on Employee Quality and Workplace Illiteracy
- ... and a couple of dozen other innovators, authorities and wizards who are making a difference in their own companies.

Enroll now using the attached reply card, or call Diane Martin or Lori Cardarelli at CIO Magazine on our toll free number, 800/343-4935, extension 4631 (in Massachusetts, 508/935-4631).

See you on Amelia Island!

Hosted by:



E-mail simply because the addressing scheme is better," he said.

The culmination that Penzias sees for these evolving technologies is an environment in which everyone does every substantial task on computer, then shares the results electronically—the computer-integrated office. Finally, said Penzias, that often-promised objective is about to be attained. "People are doing a lot more with distributed network computing than they have in the past; people are beginning to look at [new ways] of orchestrating work flows."

The first widespread implementations of the computer-integrated office have occurred within organizations such as insurers or lenders whose vast volumes of paper are limited to a few fixed formats moving along clearly definable routes. In such environments, much of the processing is already done online with either digital files or electronic images. Now these organizations are moving toward redesigning their work flows to exploit the strengths of their information systems. But in the broader corporate environment, the vast bulk of business information is stored free-form as printed notations on paper. That arrangement, Penzias said, did not become amenable to machine processing until comparatively recently, with the twin developments of cheap electronic image storage and high speed OCR.

While the essential components of the integrated office are now readily available, Penzias said, there are obstacles that still have to be overcome. Culturally, he said, office workers and professionals have become willing to give up their mounds of paper; "to get comfortable" with electronic document storage and retrieval. Technologically, the programming instructions that make the individual elements of the technology

Digital image processing and storage will be commonplace; voice and text will be readily understood by computers. The oft-promised electronic filing cabinet will finally bring order out of the chaotic mass of paper clutter.

"play together" are yet to be perfected, and probably won't be "until the next century." The reason, Penzias said, is that "integration is very, very hard. Something as seemingly simple as . . . a high-end Xerox copier [has] millions of lines of code behind it; a bookcase full of information which no one person can comprehend." Given that level of complexity, he concluded, "imagine how you would try programming an office."

There has been a well-chronicled shrinkage in the ranks of corporate middle managers during the past few years, and some analysts have attributed that to the increased use of IT for higher-level information processing functions. Growing managerial joblessness is a reality, Penzias acknowledged, but

blaming it on IT-driven organizational flattening is an oversimplification. "One of the things that I don't have a lot of understanding of is what middle managers really do," he said. "I know

they do more than the functions that can be replicated by electronic mail."

Penzias doubts the claims of companies that maintain their information technology allows them to govern the same range of activities with fewer people. "What they normally seemed to have done really is just pruned sideways rather than flattened," he said. "They seem to be smaller in all dimensions."

While Penzias believes that information technology is filled with untapped potential, he worries that much will not be realized because the growing complexity of software is overwhelming programmers. "The most troubling thing . . . is our abysmal ignorance of software," he said. "We are going down a path where the resources we have are really under severe strain."

The problem is rooted in the lack of a fundamental software science, Penzias continued. For example, mechanical engineers know with absolute certainty just how much stress a beam of given shape, size and metallic composition can withstand. That allows them to estimate the carrying capacity of a bridge deck or roof truss reliably, so they don't need to build a model first, then try to overload it with lead weights.

By contrast, software engineers often cannot tell just from reading a block of code on a screen whether it will perform as intended when played on a particular configuration of hardware. "What we do instead with software is we test it," Penzias said, and since the package is completed before it is established conclusively that it can work, programmers' intuition about which paths to follow or what design tradeoffs to make becomes paramount. "When you've got nothing to guide you but intuition, it gets awfully hard," Penzias said, "not just to find faults, but [to know] that what you've written is really what you want."

That's not likely to change any time soon, Penzias said. "Software is expensive and likely will continue to be. [It is the CIO's] biggest and most important asset, [and] one has to work to conserve that asset and make as good a use of it as possible." □



PENZIAS (left) and ROBERT W. WILSON used Bell Telephone Labs' horn-reflector antenna in their Nobel Prize-winning research.

**Give us one day,
and we'll give you the future.**

**Announcing
Directions
'91
IDC's
Annual
Computer
Industry
Briefing
Session**

The IDC Annual Briefing Sessions are sponsored by International Data Corp. (IDC) the world's leading market research, analysis and consulting firm, specializing in the information industry. The sessions are produced by World Expo Corp., a leading producer of professional conferences, seminars and trade shows for the computer and communications industry. IDC, World Expo Corp. and Technology Investment Strategies Corp. are International Data Group companies, the world's leader in information services on information technology.

Register Early and Save \$100!
***Attendance is limited and
sessions are expected to fill quickly.***



Take a unique look at the global computer industry, as we probe the issues and trends impacting users and vendors, alike. Understand the state of the industry today, and what's ahead for tomorrow as International Data Corporation, the world's leading market research, analysis and consulting firm on information technology, presents its 26th annual briefing session.

Find out why the leading computer systems companies are losing market share ... what the priorities are for user budgeting and spending ... which major distribution channels face demise in the 90's ... how open systems and standards will shift control from IBM ... what tactics successful PC suppliers are using ... and much, much more.

In just one day, you'll get the best market data, analysis and insights from the industry's top analysts.

IDC 1991 BRIEFING SESSION SCHEDULE

March 4 • Washington, D.C.	March 13 • Costa Mesa, CA
March 5 • New York City	March 14 • San Jose, CA
March 11 • Dallas, Texas	March 19 • Boston, MA

1991 AGENDA

Industry Agenda: 1991

Axel Leblois, Chairman and CEO, IDC

1991 U.S. IT Spending Outlook

David C. Moschella, Sr. V.P., Worldwide Research, IDC

The Shifting Fortunes of the Networking Industry

Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry

Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's

Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

Managing Channels for Growth

Lee M. Levitt, Dir., Distribution Channels Research, IDC

Workstation Evolution: Up or Down

Vicki J. Brown, V.P., Systems Research, IDC

The 1991 PC Market: Which Way Will Pay?

Aaron Goldberg, V.P., Desktop Computing Research, IDC

If you need to know how and why the computer industry is changing, don't miss the IDC Computer Industry Briefing Session.

CALL NOW!

To avoid disappointment, reserve your place at Directions '91 now. Call 800-225-4698 and ask for the IDC Briefing Session Rep.

Registration Fees:

\$525. Full registration.

\$425. Early-bird registration

(Save \$100 if received before February 15, 1991)

Please ask about client, government and group rates.

In Good Voice

Telephone networks have helped to transcend the spatial restrictions of doing business; now voice-processing technologies are overcoming the temporal constraints as well

BY WILLIAM W. CREITZ

Many businesses rely on information and communications systems to operate in today's economy, with its emphasis on the delivery of goods and services "anytime, anyplace." Voice-processing technologies supplement these systems with an audio information channel and human-computer interface. While telephone networks already provide "anyplace" flexibility, voice-processing automation opens up the temporal dimension for "anytime" communicating, order entry and information delivery.

Voice processing is experiencing a long-term trend toward integration. New system architectures enable it to work more intimately with telephone systems, traditional IS applica-

tions, other communications media and even users. Although some organizations are still struggling to take advantage of basic voice capability, opportunities for extensively integrated applications are plentiful. Vendors are responding by offering sophisticated voice-processing platforms that can support multiple, integrated multimedia applications.

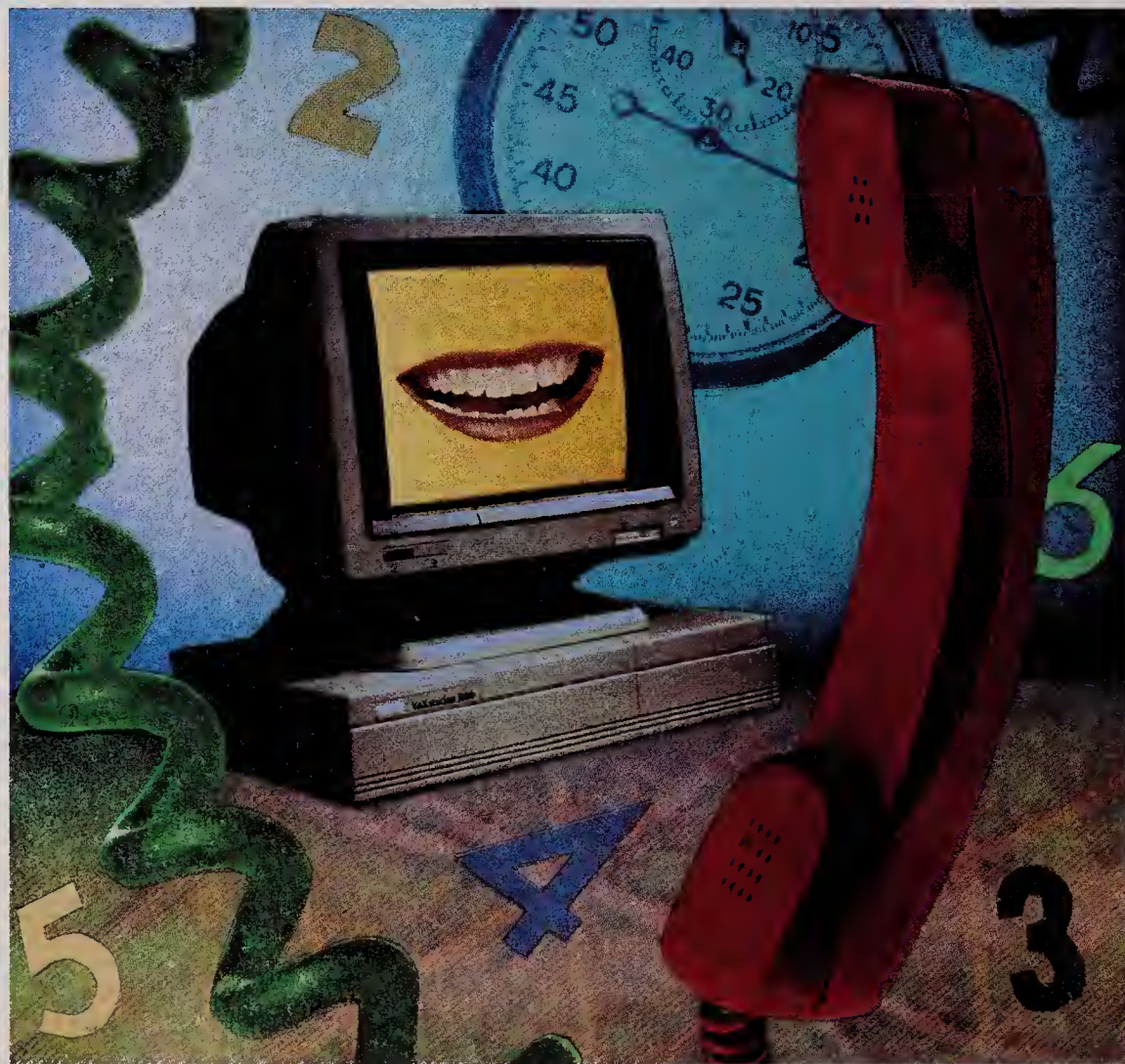
Voice Response Comes of Age

Early voice-response systems simply dispensed information, such as time and weather, over the phone. When touch-tone service became available, voice-response systems let callers select specific recorded information from a spoken menu. Today's voice-response systems have gone beyond simple interaction to become integral parts of complex information processing systems.

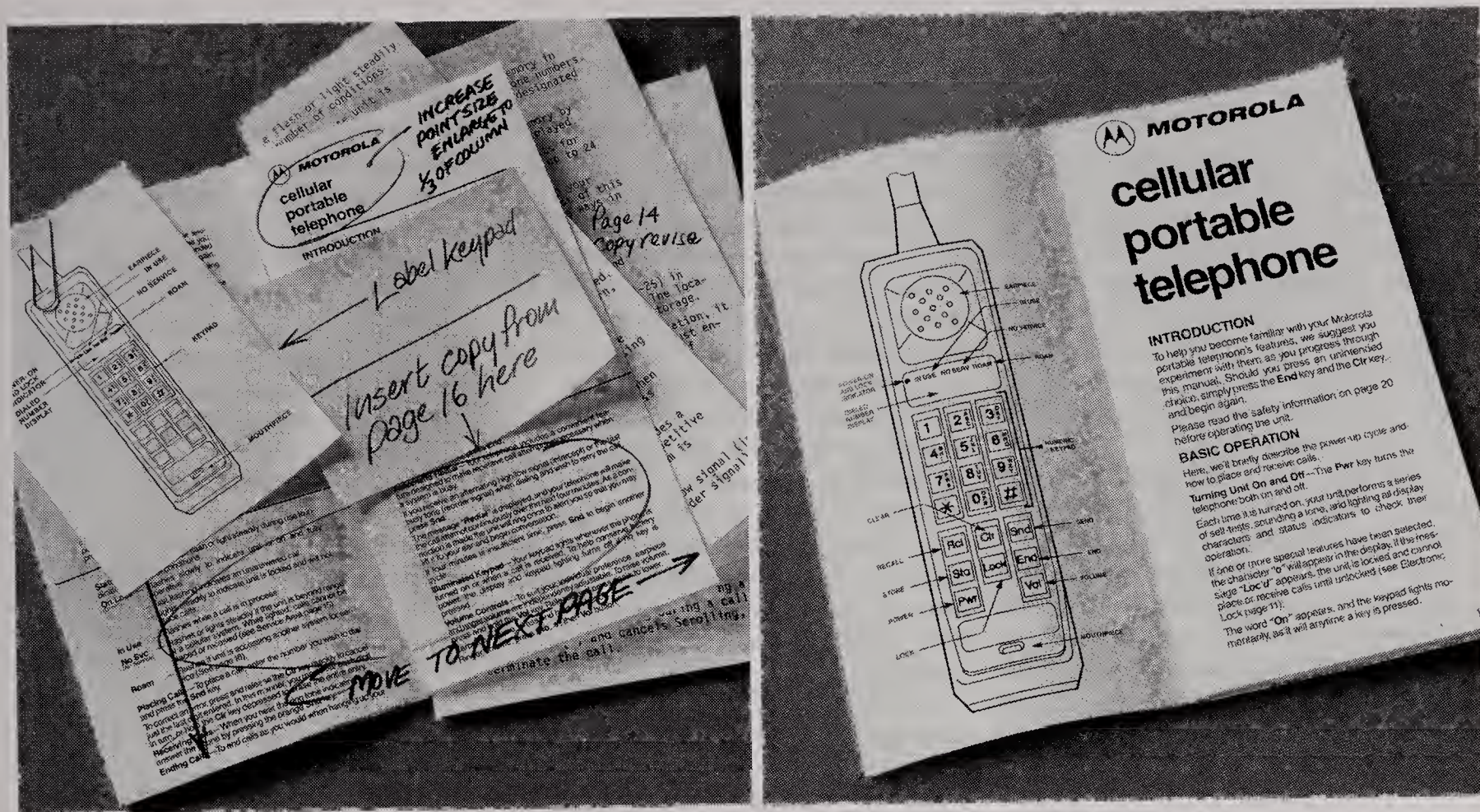
Support for telco number-identification services is one rapidly developing capability that allows voice response to integrate more closely with the telephone network (see "Getting a Line on Telemarketing," *CIO*, January 1991). On the IS side, today's voice-response systems offer a smorgasbord of interfaces, from serial communications to networks. Terminal emulation lets voice systems link to existing IS applications without host software modification.

A voice-response system that's well-integrated with IS applications and the telephone network can carry out a surprising number of activities that have traditionally been done by people. For example, a single system can handle order entry, information requests and customer service.

When a customer calls the order line, dialed-number identification service (DNIS) identifies the number that has been called and routes the call automatically to the order-entry application. Using automatic number



XEROX



Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

The manuals are now printed on Xerox laser printers just minutes after the revisions flash across the screen of a

Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics *double* their printing business every year since they came to Xerox.

Which just goes to show that a partnership with Xerox can also help a company rewrite its bottom line.

If you have a document processing problem you'd like Xerox to help you solve, call 1-800-TEAM-XRX, Ext. 125A. Or send in the coupon.

Yes, I'd like to learn more about Xerox and how they can help solve document processing problems.

- ☐ Please send me information.
☐ Please have a sales representative contact me.



Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692

NAME	Please Print	TITLE
COMPANY	PHONE	
ADDRESS		
CITY	STATE	ZIP 999-0291

© 1990 XEROX CORPORATION XEROX® is a trademark of XEROX CORPORATION

XEROX
The Document Company

identification (ANI) and database look up, the system discovers whether the caller is an established or new customer. If he or she is an established customer, the system uses text-to-speech to verbalize stored shipping and billing addresses for customer verification. (If a new customer is calling, the system records a voice message containing the caller's company name, shipping and billing addresses, phone and fax numbers and other pertinent information, which will be added to the database offline by a live agent.)

Following voice prompts, the customer enters the order via touch-tone buttons. The system provides verbal reports on stock status and shipping dates. After the transaction is complete, the system sends a confirming fax to the customer, an electronic message describing the order to the sales department, and a voice message (recorded by the customer) containing special delivery instructions to the shipping department. It also logs the order as a receivable in the accounting system and deducts the ordered items from the inventory database.

A caller needing product information can opt to either hear it from the voice-response system or have a hard copy delivered to his or her fax machine. And for a call to the customer-service number, the voice-response system uses ANI and database look-up to determine what product or products the customer already owns and might be having problems with. This triggers a corresponding set of caller options, such as routing the call to someone specializing in that product. The system can also present a series of verbal troubleshooting questions and suggestions, which the customer can use to correct problems without actually talking to a live representative.

Voice Messaging: Linking People

Voice response is centered around processing transactions and delivering information over the phone in real time. Voice messaging, on the other hand, is aimed at efficient spoken communication between people.

Unfortunately, many people still consider voice mail to be just a computerized answering machine. It is better characterized as a technology for efficient and extensive non-simultaneous interpersonal communication. It lets people break through the restriction of leaving only their name and phone number with a secretary. Voice mail not only allows people to record substantive messages, it lets them easily manipulate and disseminate those messages.

Voice-mail vendors are constantly searching for new features to increase user productivity. The guest mailbox is one especially useful option. If an employee regularly talks by phone with someone who doesn't have voice mail, a guest mailbox permits voice messages to flow in both directions.

Future delivery sends low-priority messages when rates are lowest (this feature is also handy for recording reminders to oneself). Non-delivery notification alerts the sender that a recipient didn't get a message. Priority delivery plays messages marked "urgent" first. And message-reply routes a return message to the sender without requiring entry of a destination mailbox number.

Voice-mail system architectures are maturing to better serve large, diverse organizations. Some systems can be divided into logical units, each containing a separate group of voice mailboxes, allowing a single hardware installation to support several departments or divisions. Each logical unit can be configured to match the needs of its users. For example, the company's research and development center might need a broad range of features for a few people, while the manufacturing department might need only one or two voice-mail features for many users.

Voice messaging is being integrated—sometimes with voice-response-like capabilities—with more IS applications. Shop-floor management, customer service, insurance, real estate, labor and attendance reporting and dispatch reflect the diversity of applications that can be enhanced by voice mail.

Several vendors, for example, have announced voice-mail systems that can be integrated with hotel management software. Voice mailboxes are set up on check-in without desk-clerk involvement. Calls not answered in a guest room are automatically routed to the corresponding voice mailbox for message recording. Messages can be retrieved by the guest from any touch-tone telephone on-site or off-site. Telephone charges appear on the bill as they are incurred.

Optional language libraries allow

A voice-response system that's well-integrated with IS applications and the telephone network can carry out a surprising number of activities that have traditionally been done by people. For example, a single system can handle order entry, information requests and customer service.

guests and callers to hear prompts in foreign languages. At check-out, the mailbox is deactivated and the guest has 24 hours to retrieve messages before they are automatically deleted. Besides voice mail, hotels can offer automated wake-up service, and voice bulletin boards can provide information such as conference schedules and lists of local restaurants and attractions.

Communication between Systems

As voice mail proliferated, users recognized the need to send messages

between systems. Networks now permit distributed installations to operate as one voice-mail system. Although proprietary voice-mail networking has been available for several years, machines made by different vendors could not communicate with each other.

To attack the problem, a group of voice-mail vendors, customers and service providers formed the Audio Messaging Interchange Specification (AMIS) group. This group developed two voluntary specifications for exchanging voice messages between systems that are made by different vendors.

After more than two years in development, the specifications were finalized early in 1990. The AMIS group, which is now sponsored by the Information Industry Association (IIA), is presenting the specifications to the American National Standards Institute and the Consultative Committee on International Telephony and Telegraphy (CCITT) in hopes that they will be adopted as national and international standards.

The AMIS-Digital Specification, based on CCITT X.400, supports signaling and message transfer over digital networks. Operating on a closed basis, this specification requires system administrators to arrange certain details, such as passwords and mailbox addresses.

In contrast, the AMIS-Analog Specification defines open networking between suitably equipped systems, without prior arrangements. This specification uses touch-tone signaling and analog message transfer over standard phone lines. It offers a smaller set of features than the digital specification and is suitable for use in small networks with low message volumes.

Vendors have been working to support AMIS networking as an alternative to their proprietary networking schemes. The first compatible options are now being introduced, and more should be available this year. One new service bureau is developing an AMIS-compatible gateway service offering both analog and digital interfaces to an all-digital net-

work for transparent, multinode, inter-vendor messaging. This will allow existing systems and smaller companies to take advantage of distributed voice messaging.

Another IIA-sponsored task force recently published a specification for a consistent voice-mail user interface that serves as an alternative to the proprietary keystroke assignments made by manufacturers. Developed by the Voice Messaging User Interface Forum (VMUIF), the specification defines a core set of 19 features with touch-tone keystroke assignments and a common voice-prompt

Vendors of voice technology have been working to support AMIS networking as an alternative to their proprietary networking schemes. The first compatible options are now being introduced, and more should be available later this year.

work for transparent, multinode, inter-vendor messaging. This will allow existing systems and smaller companies to take advantage of distributed voice messaging.

format. The basic repertoire includes 1 to listen, 2 to save, 3 to erase, * to go back, # to go forward, and 0 (zero) for help. With a consistent interface, all users could use the same keystrokes to perform the same functions on systems made by different vendors. Benefits include greater retention, faster response times and fewer errors. It should also reduce training time, an important consideration for the Regional Bell Operating Companies, which offer voice messaging in residential markets. Although manufacturers are beginning to offer

VMUIF options, it is expected that the specification will not be widely adopted outside RBOC services.

Toward Universal Messaging

One of the most ambitious trends in electronically delivered messages is the integration of voice mail, electronic mail and facsimile into a seamless messaging environment. This movement began when text messages stored in an electronic-mail system were verbalized over the phone by a text-to-speech synthesizer. Many voice-mail vendors now offer this capability. One of today's most popular voice-mail options is fax store-and-forward, allowing fax messages to be manipulated in the same way as voice messages.

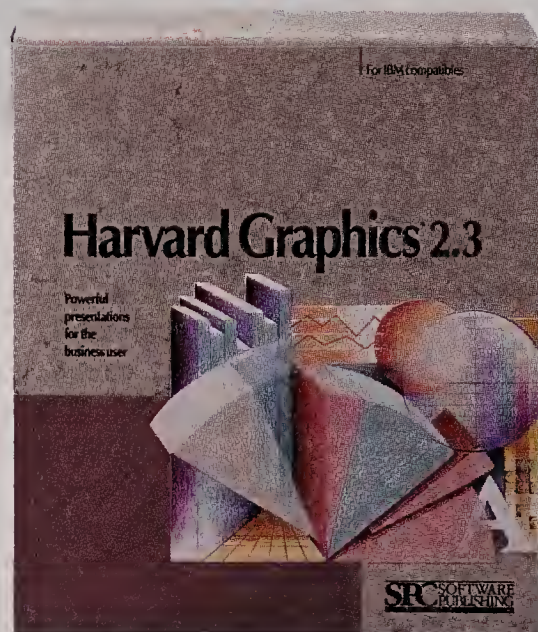
One major advantage universal messaging has over separate systems is that users receive notification for all their messages no matter how they access their mailboxes. For example, the voice mailbox provides verbal notification that a text message is available.

A second advantage of universal messaging is that a message in one medium can be translated into another (with some current limitations). Thus, after listening to a text message via text-to-speech synthesis, a user could send a copy to a colleague's fax machine across the country.

In the next decade, voice, image and text messaging may disappear as separate entities, replaced by universal messaging systems. Text-to-speech synthesis and text-to-fax conversion are available now to supplement direct E-mail, voice mail and fax. In the near term, expect to see optical character recognition used to convert fax images to ASCII text. Large-vocabulary, speaker-independent speech recognition won't be generally available until well into the next century. Eventually, universal messaging will become the preferred "anytime, anyplace, any medium" communication channel. ☐

William W. Creitz is editor and publisher of VoiceNews, a voice-processing industry newsletter located in Rockville, Md.

MAKE YOUR NEXT DOG AND PONY



HARVARD GRAPHICS® 2.3

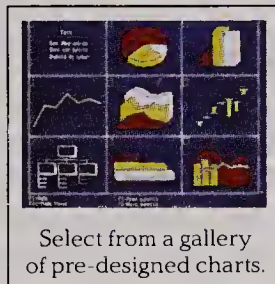
• FOR UPGRADE INFORMATION CALL 1-303-799-4900 • FOR A FREE DEMO

In Canada call 1-416-566-0566. Harvard Graphics is a registered trademark of Software Publishing Corporation. Draw Partner, ScreenShow and HyperShow are trademarks of Software Publishing Corporation. Lotus 1-2-3 and Microsoft Excel are registered trademarks of Microsoft Corporation.

SHOW EVEN BETTER. EVEN FASTER.

New Harvard Graphics 2.3 from Software Publishing Corporation is

packed with new features that will make your presentations more effective. For starters,



we've added a chart gallery, so even first-time users can make sophisticated presentations almost instantly.

Pick a chart type that looks good, enter your data, and there's your

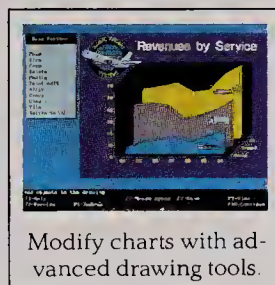


chart. With the colors and layout you'd expect from a graphics professional.

Linking those charts to spreadsheets is better than ever, now that we've added hot links to



Microsoft Excel®. If your Lotus 1-2-3® or Excel data changes, so does your chart—automatically. And because we've fully

integrated Draw Partner™, our advanced drawing package, you can modify

your chart with tools like rotate, skew and zoom. Without losing the tie to your charting data.

What's more, you can now create a whole new type of ScreenShow™—

HyperShow™. Click on hot buttons you've created in any chart and get backup information instantly.

You can actually tailor the flow of your presentation while you're giving it.

Harvard Graphics has always been the quickest way to great-looking presentations. That's

why it's the best-selling business graphics software. Now, you can do more than ever. Faster than ever.

ISK, CALL 1-800-345-2888, OPERATOR 329 •

emarks of Lotus Development Corporation and Microsoft respectively. © 1991 Software Publishing Corporation, 1901 Landings Dr., Mountain View, CA 94039 7210

SPC SOFTWARE
PUBLISHING
CORPORATION

Putting Training on Track

IS departments that have given training short shrift can implement new and better programs with a little help from senior management and the latest technology

BY ELY S. LURIN

IS departments are organized to provide service to their companies, with the emphasis on developing new systems, maintaining existing systems and following new technology. Since IS staff and end-user training is not considered a major part of IS, it rarely receives the attention it deserves. Instead, it is often managed by someone four levels below the CIO and forced to make do with an inadequate budget.

That doesn't have to be the case. But in order to improve training, it helps to understand how the current organizational structure of most IS departments precludes significant changes in policy and the use of new training technologies.

The difficulties result primarily from a failure to provide leadership with the experience and authority to implement modifications and innovations. In most cases, the training staff lacks sufficient technical background and project management ability to develop far-reaching programs. Nor do junior trainers normally have enough clout to convince IS staff and users to try something new and different. And while the staff may pos-

sess a strong background in training methods, it may not have sufficient knowledge of new developments in training technology.

Also, while major changes in training cost money, their benefits are not easy to quantify. Although the pay-back often takes a year or less, junior training staff may not have the experience to justify the investment.

The present status of training in IS departments is documented in the report "Data Processing and Telecommunications Training Techniques and Implementation Processes," published by Frost & Sullivan Inc. of New York. Designed to assist IS managers in developing training departments, the report was based on 300 detailed questionnaires completed by IS executives.

The report makes clear that a great deal of time is devoted to IS training. The amount varies according to job function: Each member of an IS staff spends 27 hours per year in training; each member of a telecommunications staff spends 25. Users of IS systems spend 16 hours a year in training; users of simpler-to-operate telecommunications systems



ILLUSTRATION BY GARISON WEILAND

spend only about nine. And customers receive an average of nine hours of training per year.

The questionnaire also asked executives to rate, on a five-point scale (five being the highest), the importance of different types of training. Respondents gave the highest rating (4.4) to procedural training, which explains how to use a program. Human relations training, which teaches how to cope with a difficult user, was ranked second (3.5); theoretical training (why the program was written in a certain manner), and company policy training (when to use a program), both received a 3.0.

The report also examines the distribution of IS training budgets. The average IS department spends 3.5 percent of its budget on training; this includes the development and/or purchase of training courses and trainers' salaries. The report also breaks down IS training expenses by educational approach: 40 percent is devoted to instructor-led training; 20 percent to preparing manuals for unique IS-prepared programs; 20 percent to computer-based training (CBT); 10 percent to videotape; and 10 percent to interactive video.

The dominance of instructor-led training is indicative of some of the problems inherent in the system. Instructor-led training, the most prevalent and popular method, has its advantages. Generally, IS staff and users believe that they learn better and receive more attention from a live instructor. Theoretical training is better accomplished by a live instructor. And instructor-led training can build good relationships between the IS staff and its users.

But a training program that relies exclusively on live instructors forfeits the considerable advantages offered by self-paced training (for instance, CBT or interactive-video instruction [IVI]). Instructors cannot efficiently hold classes for only a few people at a time. Self-paced training, on the other hand, makes more efficient use of time, particularly when it involves only one or two people: for example, employees at a remote site, or a new employee. Most training professionals believe that self-paced training allows students to reach the same level

Junior trainers don't normally have enough clout to convince IS staff and users to try something new and different.

of proficiency as instructor-led training in half the time. Clearly, there is an optimum mixture of instructor-led training and self-paced training for each IS organization.

The findings of the report and the attitudes of the trainees clarify two issues that must be addressed when setting up a new training program or modifying an existing one. First, users and IS staff want to be sure that the time they spend on training will not be wasted. Second, they need someone who can change their thinking and encourage them to try new training techniques.

Junior training staff cannot change this thinking without the support and leadership of IS management. Training technology is sophisticated. There are many options, such as CBT, IVI, passive videotape instruction, off-the-shelf training, customized off-the-shelf training and internally developed training. Systems that assist the training staff to prepare CBT and IVI are a long-term investment. Senior program managers must handle this complexity and make long-range strategy decisions.

These are organizational and management issues, and the best way to address them is to shorten the management chain. A senior manager who reports directly to the CIO should be put in charge of training, with the assignment of developing a training strategy acceptable to IS staff and users. The training staff will still perform detailed work, but a senior manager will add management judgment, project-management skills, an understanding of how to incorporate new technology into IS, and experience in contracting with vendors. More important, a senior manager has the skill and position to have new training approaches accept-

ed, justify training expenditures by quantifying value to the company, and develop a long-range strategy that ensures acceptance and takes advantage of new technology.

A case study illustrates how one company improved its training practices by making an organizational decision to provide top IS management support. At Atochem, N.A., of Philadelphia, training took place in internal instructor-led courses. However, the need to train people at distributed sites made this approach inefficient, and new IS requirements would have exacerbated the situation. Executives appointed a senior manager who would report directly to the CIO.

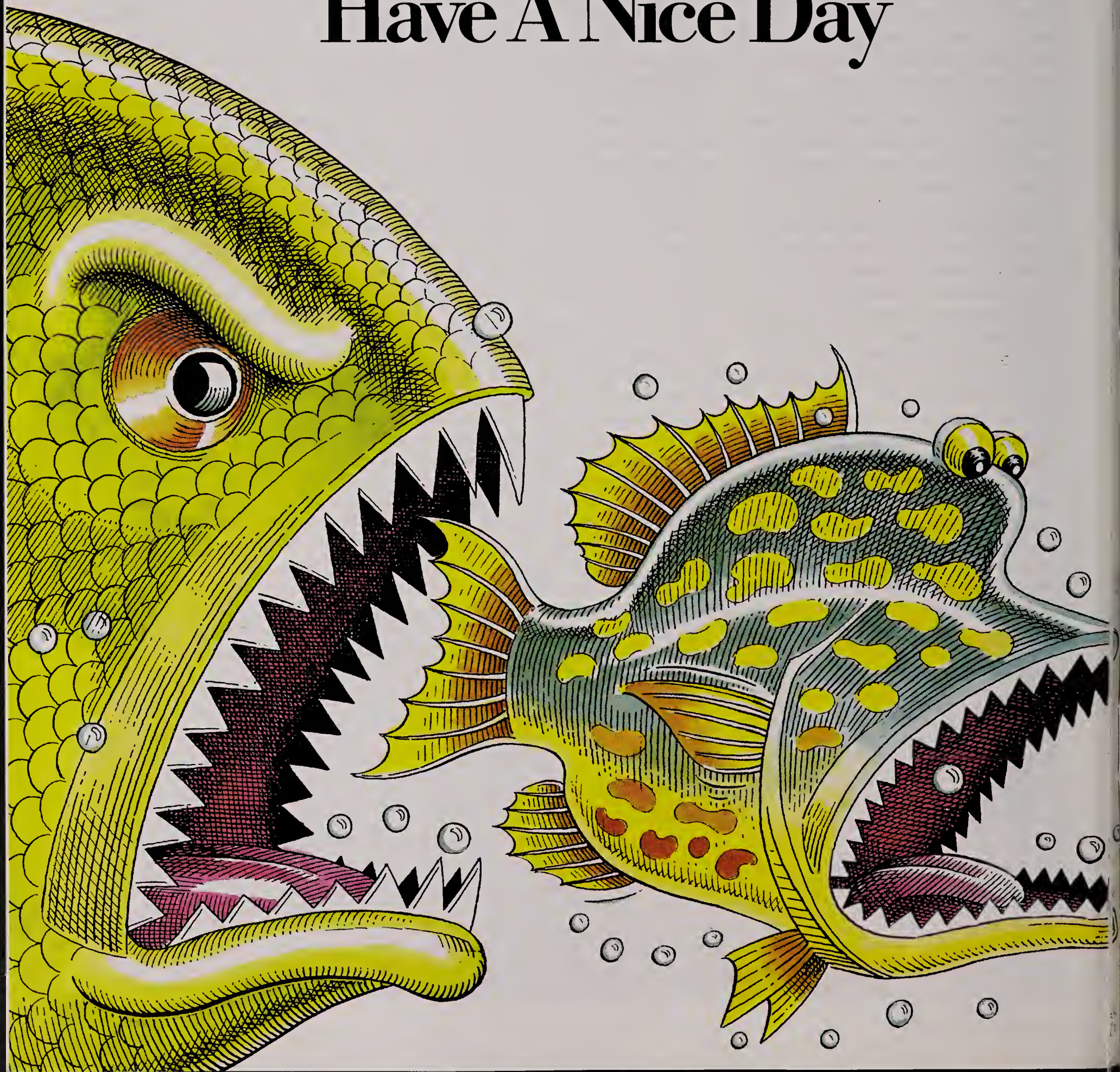
The strategy was to make a technology jump by employing a system from New York-based ADAR International, which uses expert-system technology to design and write CBT courses. The executive chose an experienced staff member from the user support group to operate the system. Since she had no previous experience in training or in expert systems, it took her about two months to learn to use the expert system as a tool, during which time she received support from the executive in charge. The introduction of the system was successful, and it now produces training courses for IS systems. Atochem has achieved such a high level of proficiency that the expert system prepared 12 units of CBT (each 25-30 minutes long) in less than two months.

This is one example of a senior executive, with the support of the CIO, facilitating the introduction of a totally new training approach into an IS department. Senior managers had sufficient experience to justify the expense, and IS user support staff received strong support. The expert system produced high-quality CBT that users accepted. The system operator relied on the expert system and did not try to "beat it" or show that it did not work. But most important, the CIO provided a powerful drive to succeed. In the end, that was what made the project work. 

Ely S. Lurin is president of ELJAN Inc., a consultancy in Great Neck, N.Y.

IBM DATA ACCESS SOLUTIONS

Welcome To The American Marketplace, Have A Nice Day



With an IBM Data Interpretation System, it's never been easier to outmaneuver and outrun whoever happens to be on your, well, tail.

Mainly because it lets you get your hands on critical data—even competitive data—from anywhere in the building, or anywhere in the country. So you can make informed, strategically sound decisions.

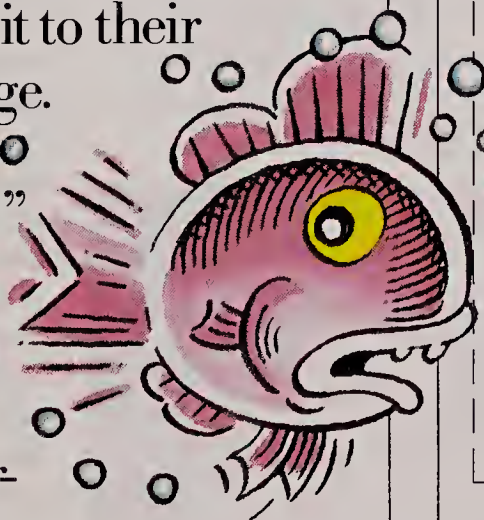
Instead of rough estimates.

The IBM Data Interpretation System (DIS) is graphical, mouse-driven software that actually lets you access, manipulate, analyze, share and store information—right from your own desk.

And, speaking of information, a recent customer survey shows that on a typical work-day customers spend a full 50% of their time gathering information—and only 10% using it to their competitive advantage.

The good news? When customers used the right system, the exact opposite was true:

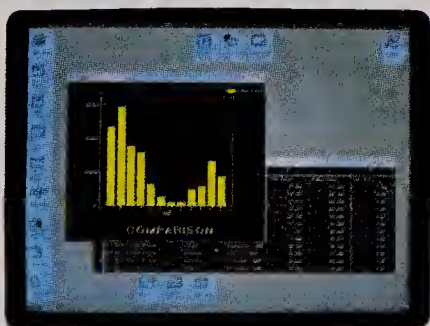
Time spent gathering data plummeted to 15% while time spent outsmarting sharks jumped to 55%.



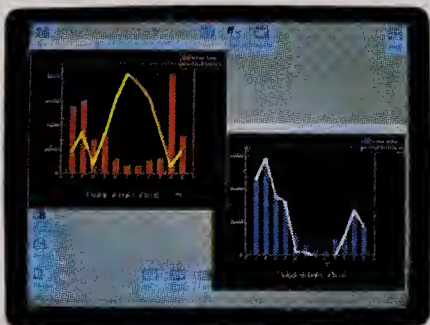
Whether your data resides in big computers,



mid-size computers



or any computers, anywhere at all:



a simple point and click bring you insight and analysis.

In other words, you could have more control over the market than you think. And we can help—with more than just terminals and disk drives.

For example, with our in-depth knowledge of dozens of industries, coupled with our ability to help businesses improve profitability by increasing revenue (not just cutting costs), we're with you every step of the way—from early consultation, to finding new uses for DIS, to enterprise-wide implementation.

All of which can help you enjoy something 365 times more satisfying than a nice day:

A banner year.

For more information, call us at 1-800-IBM-6676, ext. 902, or mail the coupon below.

Please send me more details on how IBM can help me have nicer days.

Clip and mail to: IBM

Dept. 902
P.O. Box 3974
Peoria, IL 61614
Or call: 1-800-IBM-6676, ext. 902

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

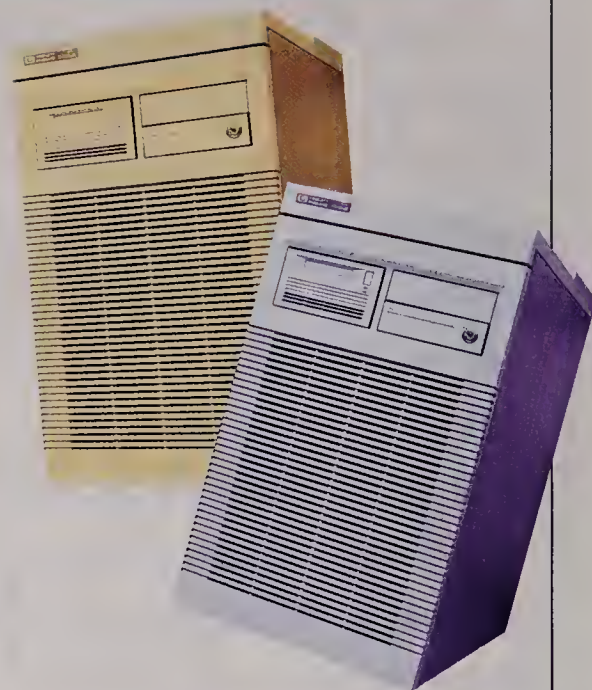
Phone _____ CIO

IBM®

FYI

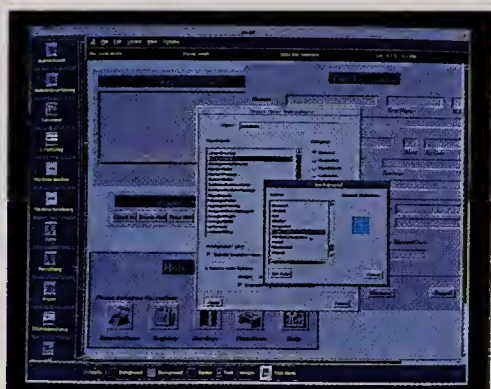
RISC-y Business

RISC aficionados take note: Hewlett-Packard has added five new workhorses to its line of RISC products. The new machines, which have joined the company's HP9000 Series of UNIX computers and the HP3000 line, are based on Precision Architecture-RISC (reduced-instruction-set computing) technology. They range in price from \$275,000 for an HP9000 Model 865S (available in the second quarter of this year) to \$85,000 for the HP9000 Model 842S. Intended for typical client-server and multiuser applications, the five midrange RISC newcomers could provide the computing power to support network-management, communications and online transaction processing. The new machines may also prove to be a cost-effective boon to customers interested in downsizing mainframe applications. Sales information is available by calling 800 752-0900.



Programming Without Pain

Coming face-to-screen with a computer can be an intimidating experience for the uninitiated. Consequently, developing angst-free user interfaces is a serious business for programmers. But what about the programmers themselves? Siemens Nixdorf Information Systems' programmer-friendly development tool is designed to take the pain out of building graphical user interfaces based on the OSF/Motif standard.



XBUILD Release 1.1, which is based on an intelligent object library and an interactive editor, will reduce the cost and complexity of developing applications, according to Siemens. Programmers create interfaces using graphical objects, or "widgets," that can be extended to include user-defined widgets to meet corporate standards or customize applications. Programmers can also test their work in progress by implementing a test mode.

XBUILD generates C code or higher-level OSF user interface language and supports a variety of platforms. A source code version is priced at \$5,000, and a trial version is available for programmers who want to try before they buy. For more information, call Siemens at 617 273-0480.

Palette Pleaser

Certain things are inevitable: death, taxes and the impossibility of getting your presentation slides prepared to your liking by an outside source. Businesspeople frustrated by the artistic requirements of public speaking may want to take note of Polaroid's recent offering—a film recorder that will let even the most harried presenter use a PC to pull together polished, high-quality graphics in time to catch the last flight out.

Digital Palette CI-3000 offers presentation- and documentation-quality graphics with high spatial and color resolution, a choice of 16.7 million addressable colors, and gray scale balance for both graphics and natural imaging applications. Digital Palette is compatible with a wide range of business graphics packages (including Polaroid's own), supports 18 film formats and offers imaging options including 35mm instant slides and other transparencies as well as instant color prints. In addition, the system has special features such as professionally created templates, fonts and color schemes. The average user can create a slide in under 10 minutes. The system is priced at \$4,495. For more information, call 617 577-2000.



Sights and Sounds

The day when users will be able to see their applications jump about and hear them sing is a little closer, thanks to the efforts of Microsoft and Intel.

Software giant Microsoft has created a multimedia development kit for its Windows operating system. The new tools will allow applications developers to add full-motion video and stereo audio storage and manipulation capability to any Windows-based application. The kit is available now for selected test sites, and general availability with a price of \$500 is promised within the next few months.

Along with the new toolkit comes a series of multimedia hardware and software specifications that Microsoft has worked out with IBM. Big Blue has promised to incorporate those specs into its products.

Meanwhile, chip-maker Intel's Princeton, N.J., research operation has produced a \$100 pair of integrated circuits that can give most PCs the power to handle the immense volume of data needed for storing moving pictures. The Intel i750 DVI chips compress the data down to less than 1 percent of its former size for storage and retrieval. Samples of the new chip became available at the end of last year; volume production is planned for this quarter.

For further information on the toolkit, call Microsoft at 206 882-8080. Intel can be reached at 408 765-8080.



INTRODUCING THE FIRST SHOW OF FORCE IN OBJECT TECHNOLOGY.

REGISTER FOR OBJECT WORLD, JUNE 3-7, 1991, SAN FRANCISCO.

Why are more and more smart companies embracing object technology? Because they want to get an edge on the competition.

It's true. Enterprising companies are betting on object technology as the way to decrease development time, lower the cost of maintenance, and reduce the complexity of applications programming.

Object World will bring together users and vendors of object technology for five intensive days of seminars, conferences, and exhibits. It all takes place June 3-7 at the historic Fairmont Hotel in San Francisco.

A PRACTICAL LOOK AT WHAT'S AVAILABLE TODAY.

Object World is the first show of force in object technology. And the first industry event to focus exclusively on its commercial aspects.

You'll hear firsthand from industry leaders like: Esther Dyson, *Release 1.0*; Christopher Stone, Object Management Group; Brad Cox, Stepstone; John Rymer, Seybold Office Computing; Tom Love, Orgware, and more. And get the inside story on how IT professionals like you are successfully using object-technology products in business today.

TWO DAYS OF IN-DEPTH SEMINARS.

Attend dynamic half-day seminars like: An Executive Briefing on Object Technology (OT); Building Commercial Object Applications; Integrating Legacy Systems with Objects Systems; OT Tools

and Building Blocks; Surviving the Move to Objects; Adding Sizzle to Object Applications; The Emerging Software Components Industry; and Integrating Objects and Databases.

THREE DAYS OF POWERFUL PROGRAM SESSIONS.

Or take part in hard-hitting program sessions divided into four separate tracks:

- *The Applications Track* focuses on managing the development process, analysis and design, applications frameworks, and the future of object management systems.

- *The Management Track* covers subjects like gaining competitive advantage, adopting object technology, leapfrogging technologies with OT, and migration planning.

- *The Technology Track* explores topics like needs assessment; evaluating languages, environments, and databases; and standards and user groups.

- *In-depth Applications Case Studies* give you a close-up look at the many companies who are running object-oriented commercial applications today—the successes, as well as the failures.

VISIT THE LEADERS OF OBJECT TECHNOLOGY.

In between you can stop by our exhibit hall and talk with companies like AT&T, Borland Interna-

tional, Digital Equipment Corp., Digitalk, Hewlett-Packard, Parc Place Systems, Servio Corp., Sun Microsystems, and more—the people who are shaking up the present and shaping the future of object technology.

WHO SHOULD ATTEND?

Chief information officers, IS managers, MIS/DP managers, technology planning managers, managers of systems development/architecture, programming supervisors, and software development managers. In short, anyone and everyone who wants to explore the potential of this rapidly growing technology should be in San Francisco June 3-7, 1991.

Attend Object World, the first show of force in object technology.



**JUNE 3-7
SAN FRANCISCO**

SAVE \$100.

REGISTER FOR OBJECT WORLD BY APRIL 1.

This coupon is worth \$100—if you register for Object World by April 1, 1991. For more information and a complete registration package, please call (800) 225-4698 or mail this coupon to: Object World, c/o World Expo Corp., 111 Speen Street, P.O. Box 9107, Framingham, MA 01701-9107.

CAN'T WAIT? REPLY BY FAX: (508) 872-8237.

☐ **YES.** I plan to attend Object World. Please rush me a complete information package so I can register early and save \$100.

NAME

ORGANIZATION

STREET

CITY STATE/ZIP

COUNTRY

TELEPHONE

FAX

Object World is sponsored by the Object Management Group, the leading organization dedicated to promoting the commercial success of object technology worldwide. The event is produced by World Expo Corporation, an International Data Group Company, the world's leader in information services on information technology.

9CIOB

EVENTS

The Restructuring & Outsourcing Conference

Orlando World Marriott,
Orlando, Fla.
February 27-March 1
META Group and Digital
Consulting Inc.
508 470-3880

Topics include outsourcing software support, automated data center operations, downsizing, evaluating outsourcing proposals and prioritizing selective outsourcing decisions. There are also tutorials on restructuring and automating data centers. Registration fees: \$100 for tutorials; \$995 for full conference.

CIO Perspectives: Maximizing Profits through Information Technology

Amelia Island Plantation,
Amelia Island, Fla.
March 10-13
CIO magazine
508 935-4274

Widening profit margins by improving managerial effectiveness and productivity through information technology is the aim of this conference. Industry practitioners and authorities address critical success factors, negotiation strategies, restructuring, multivendor systems integrators, measuring IT's relationship to profitability, total customer satisfaction, and quality. Registration fees: \$895-\$995.

Supercomm '91 Conference & Exhibition

George R. Brown Convention
Center, Houston
March 18-21

U.S. Telephone Association and
Telecommunications Industry
Association
202 835-3100

The future of telecommunications is the focus of this conference and exhibition. There are 52 free sessions in tracks ranging from technology and operations to marketing and policy, as well as seminars covering such topics as network management control, infrastructure development and open network architecture. "Fiber Perspectives '91," a separate program on fiber and wireless technologies, is co-sponsored by *Telephony* magazine. Tracks include technology and product trends, marketing and management, and OSP strategies. There are also tutorials on ISDN and wireless communications. Registration fees: \$75; \$395 for "Fiber Perspectives."

National NET '91

Loews L'enfant Plaza Hotel,
Washington
March 20-22
EDUCOM NTTF
202 872-4200

The theme of this conference is how organizations can develop and maintain a national information infrastructure. Demonstrations on the nationwide high-speed NSFNet will be highlighted, and interactive applications currently in use at universities and research laboratories will be presented. Speakers will represent government, industry and education. Registration fees: \$295-\$345.



I N D E X

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

AT&T	62
AT&T Bell Labs	62
ADAR International	76
Accountemps	12
Air Products and Chemicals Inc.	50
Allstate	12
Amdahl Corp.	24
American Express Co.	24, 62
Apple Computer Inc.	12
Atochem N.A.	76
Bank of America	24
Bank of Boston, The	36
Bechtel Corp.	50
Citicorp	62
Citicorp Services Inc.	24
Cray Research Inc.	24
Digital Equipment Corp.	36
Dow Chemical Co.	12
Exeter Holdings Ltd.	12
Frost & Sullivan Inc.	76
IBM Corp.	12, 24, 36
InfoGenesis	12
K mart Corp.	36
Kloster Cruise Ltd.	12
Lithonia Lighting	36
Marriott Corp.	12
Merrill Lynch & Co.	12

Motorola Inc.	12
Mutual Benefit Life Insurance Co.	50
Northrop Corp.	12
PVA Systems	12
Pacific Mutual Life Insurance Co.	50
Prime Computer Inc.	12
Seagram Co., The	12
Security Pacific Corp.	12
S-K-I Ltd.	36
US Sprint	12
Walt Disney Co.	12
Wang Laboratories Inc.	12
Weyerhaeuser Corp.	50
Xerox Corp.	62

Advertiser Index

AT&T	C4
AT&T Technologies	42
Andersen Consulting	46
Apple Computer Inc.	14
Boole & Babbage Inc.	11
CIO Magazine	66
Computer Associates International Inc.	2, 28, 60
Digital Equipment Corp.	C2
Execucom Systems Corp.	C3
Fujitsu Ltd.	17
Hewlett-Packard Co.	56
IBM Corp.	22, 78
Index Technology Corp.	9
International Communications Association	49
International Data Corp.	69
NewsNet Inc.	53
Object World	81
Oracle Corp.	4
SAP America Inc.	19
Smithsonian Institution	83
Software Publishing Corp.	74
Tandon Corp.	38
Texas Instruments Inc.	6
Unisys Corp.	32
Xerox Corp.	71

CIO Sales Offices

President and Publisher

JOSEPH L. LEVY
508 935-4601

Vice President/ Associate Publisher

ROBERT E. BLOCK
508 935-4735

Manager, Marketing Services

LORI CARDARELLI
508 935-4631

Advertising Sales Assistant

LISA B. SHIFMAN
508 935-4035

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 872-8200, FAX 508 872-0618

EAST COAST

Regional Director/ Advertising Sales

ROBERT E. BLOCK

CIO Publishing Inc.
492 Old Connecticut Path
PO Box 9208
Framingham, MA 01701-9208
508 935-4735, FAX 508 872-0618

MIDWEST/SOUTH

Regional Director/ Advertising Sales

BILL McDONOUGH

Advertising Sales Assistant

CAROL LEE GOCKENBACH

CIO Publishing Inc.
10400 West Higgins Road, Suite 300
Rosemont, IL 60018
708 827-4515, FAX 708 827-9159

WEST COAST

Regional Director/ Advertising Sales

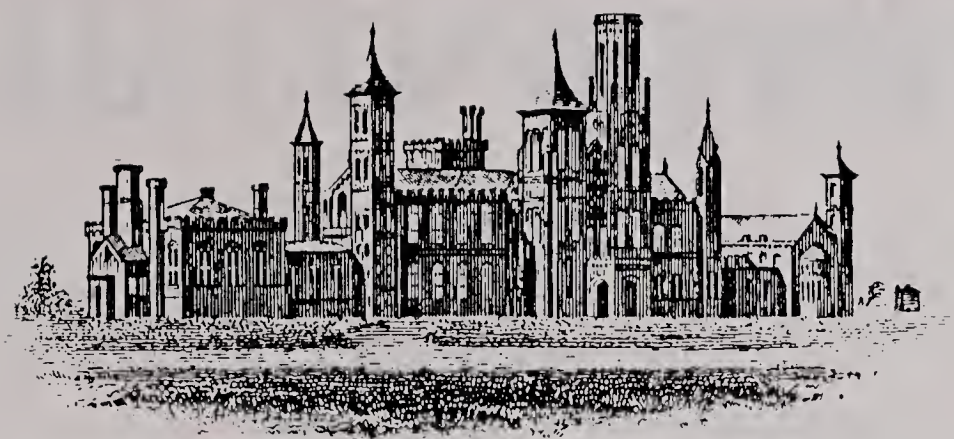
LINDA HOLBROOK

Advertising Sales Assistant

MARYANN DUYN

CIO Publishing Inc.
220 Montgomery Street, Suite 622
San Francisco, CA 94104
415 398-8200, FAX 415 398-4649

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208 - (508) 872-8200. **Postal Information:** CIO (ISSN 0894-9301) is published monthly by CIO Publishing Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Second-class postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1990 by CIO Publishing Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Editor, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: Φ . **Microfilm:** CIO issues and articles can be purchased on 16mm and 35mm microfilm and on 105mm microfiche through University Microfilms International, Serials Acquisitions Department, 300 N. Zeeb Road, Ann Arbor, Michigan 48106. **Subscriptions:** Address subscription inquiries to CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208 or call (508) 872-8200. CIO is distributed free of charge to qualified top information executives. To all others, the one-year basic rate for the U.S. and Canada is \$63. For rates to other countries, please write the publisher. The single copy price is \$7. All subscriptions payable in U.S. funds only. Please allow four to six weeks for new subscriptions to begin. **Change of Address:** Please allow four to six weeks for change of address to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.



The Smithsonian Institution, Washington, D.C., is seeking candidates for the newly created position of Director of Information Strategies to serve as "Chief Information Officer." Incumbent will provide strategic leadership to Smithsonian-wide information technology initiatives and initiate/analyze the potential for strategic technology partnerships with other organizations.

Candidates must have substantial knowledge of information technology trends/uses, including hardware/software/communication/multimedia publishing technologies; visionary ability to analyze the informational needs of a large, highly complex organization and to develop/implement responsive informational systems. Highly desirable is the ability to negotiate successfully innovative synergistic relationships with information technology providers/users. Salary will be commensurate with experience.

Applications must be received by March 29, 1991. Applicants must submit an Application for Federal Employment (SF-171) to: Office of Human Resources, Smithsonian Institution, P.O. Box 23762, Washington, D.C. 20026-3762. ATTN: EX-01-91-T.

For further information, telephone Roberta Strohl, 202-287-3100, ext. 223. An Equal Opportunity Employer.

Smithsonian Institution

CONFERENCE CALL

QUESTION: *What are the cost benefits and trade-offs of outsourcing?*

In these excerpts from a panel on outsourcing and systems integration at the CIO conference held in Palm Springs, Calif., last October, panelists discuss where the cost benefit of outsourcing lies—if indeed it is measurable at all.

Katherine Hudson

Senior vice president and director of corporate information systems for Eastman Kodak Co. in Rochester, N.Y.

“We went through a significant analysis of where corporate IS within the Eastman Kodak Co. adds value. And we found primarily two places: One is wherever we can solve a business problem, and the other is where we can create a business opportunity.

“With that in mind, we took what has become a quite controversial step of trying to find a better way to deliver absolutely critical and absolutely necessary services to our corporation [without] using extremely scarce human and dollar capital. Despite being a \$20 billion and profitable corporation, we face, as everyone faces, limited resources. These kinds of opportunities—to think differently, to get services delivered differently through strategic partnerships [with outsourcers]—is what we tried to do. I think the bottom-line value for us included a better focus of management attention on the use of the technology as opposed to whether the machines and network were up and running. And we were able to measure the return from our activities with our strategic partners. We generated almost a dollar-per-share of value for our corporation.”

Chuck McCaig

Senior vice president of corporate services for Mutual Benefit Life Insurance Co. in Newark, N.J.

“I am generally negative toward outsourcing. It is a lot riskier than people first assume. When you go in looking for the economic benefit, it looks very, very attractive. But managing it over time does require that the two organizations share a common interest, and those interests will change over time, and it's difficult to take back [your operations].

“We went to outsourcing to save money. We didn't think that they could do it better than we could do it; we thought that they could do it cheaper than we could do it.

“When we look at systems integration, however, we're going out to buy experience and talent. We don't know how to do something, or we don't think we can do it as well as someone else has done it before. And frankly, we expect to pay more than we would to do it ourselves. But here what we want to do is use the systems integrator to jump start [our operations]—

to get us going so that we can get the business benefit fast and then get some experience later on.”

Mike Petitweiss

Technical advisor at Scudder, Stevens & Clark Inc., an investment council firm in New York

“Our position on outsourcing [is] undecided. In the short term, there are probably a lot of good reasons to do it—not least of which is applying expertise we don't have in-house to things that are basically infrastructural so we can concentrate our limited resources on the real value-added areas. On the other hand, given the fact that we don't have the scale to create fundamental joint ventures and logistics alliances, we can end up at the mercy of an outsourcing vendor, because their loyalties are going to be divided amongst their customer base.

“We do not view systems integration as nice to have, or even as an option. We view it as an absolute competitive necessity and recognize that it needs to be the center of our information agenda. Outsourcing appears to be one available opportunity, but we're concentrating on internal expertise building and realizing some measurable economies out of integration.”

Ray Wiltshire

Vice president of computer-aided productivity at Martin Marietta in Bethesda, Md.

“There are some real advantages to creating alliances with partners in your business activities. [A recent Department of Defense study states that] a 30 percent or so reduction in time and cost are the real benefits of integration. Using object-oriented programming, we are realizing a 30 percent reduction in costs on major prime contracts. In integrated manufacturing, we're again realizing 25 percent to 30 percent cost reductions. People in the outsourcing industry—and not just Martin Marietta, but Boeing and McDonnell Douglas—are now offering these kinds of savings in outsourcing contracts.

“However, if you're getting into outsourcing because it's tough managing your internal information systems or internal networks, and you think there's some panacea in managing that with a third party, you're kidding yourself.”

Readers are invited to suggest Conference Call questions. Contact Senior Writer Meghan O'Leary at 800 343-4935, ext. 4733, or by fax at 508 872-0618.

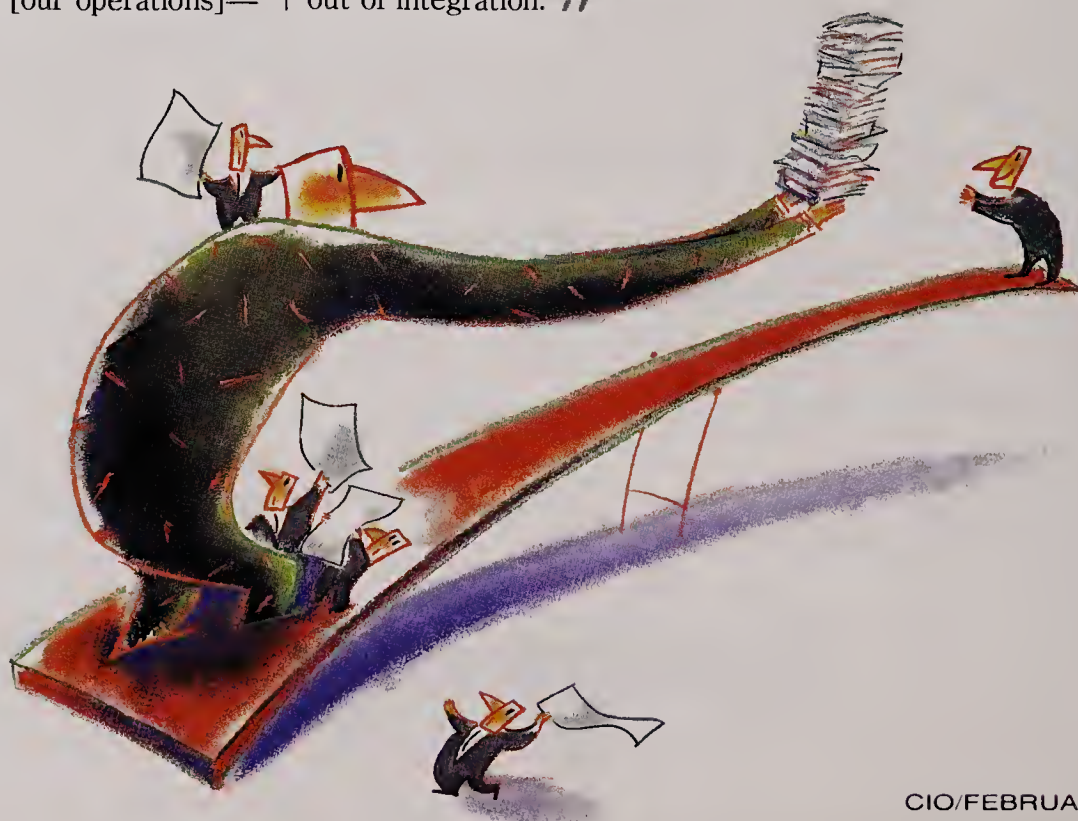


ILLUSTRATION BY BETHANY GULLY

WHAT DO THE INDUSTRY'S TOUGHEST EIS CRITICS THINK OF EXECUTIVE EDGE? CUSTOMERS HAVE SPOKEN.

How Customers Rated The "Big Three" *

	Executive Edge®	Commander®	Command™ Center
Quality of service and support	8.5	7.3	7.4
Ease of customization	8.3	7.5	7.9
Well integrated DSS	8.2	7.7	6.2
Varied application shells	7.9	7.0	7.7
Useful online help	7.7	6.1	6.3
Pricing and maintenance	7.5	5.7	6.7

*Based on results of *Computerworld* Survey published July 16, 1990

Industry analysts, the trade press, end users and MIS can be pretty tough on EIS software vendors.

We welcome the criticism. Because it underscores what we've thought all along: Executive Edge is the leading EIS solution in terms of ease of customization, service and support, integrated DSS capabilities and a lot of other product features that matter to our customers. ***"Execucom's Professional Services group really made the difference during the implementation of our EIS project. Their competence in understanding how to fit together our executive's needs, as well as the company's, with our existing technology and the demands of the market was a challenge we could not have overcome alone. Execucom knows how to make systems work for their customers."***

The upshot of a recent *Computerworld* survey: customers gave Executive Edge the highest scores among the "Big Three" EIS vendors. In fact, Executive Edge scored the highest in more than half of the survey questions, as well as highest in two-thirds of the questions that users rated most important.

Not bad for a DSS software leader that entered the EIS arena only two years ago. In fact, we became the first EIS vendor in history to receive ICP's "Million-in-One Award" when sales of Executive Edge surpassed the \$1 million mark after only three months on the market!

Executive Edge has been well received for a very good reason. It's a true Executive Information System, one that's easily customized and designed to give top executives crucial strategic information and simple-to-use, AI-based decision support tools that enable executives to analyze and explain business trends with the click of a mouse or by using an infrared remote control unit.

The bottom line? Executive Edge can make a critical difference in your company. To learn how your firm can gain the Edge, call us toll-free at 1-800-531-5038. In Texas, call 512-327-7070. In Canada, call 1-800-558-1390.

Bernie Campbell
EIS operational sponsor and director of Information Services,
Sonoco Products Company

"The Scorecard system (a custom-ready application delivered with Executive Edge) was something ideal for our needs. We wanted to install a customized prototype of an EIS that we could deliver to our managers quickly."

Joyce Tomboulia
Financial Planning Systems Project Leader,
City of Calgary, Alberta.

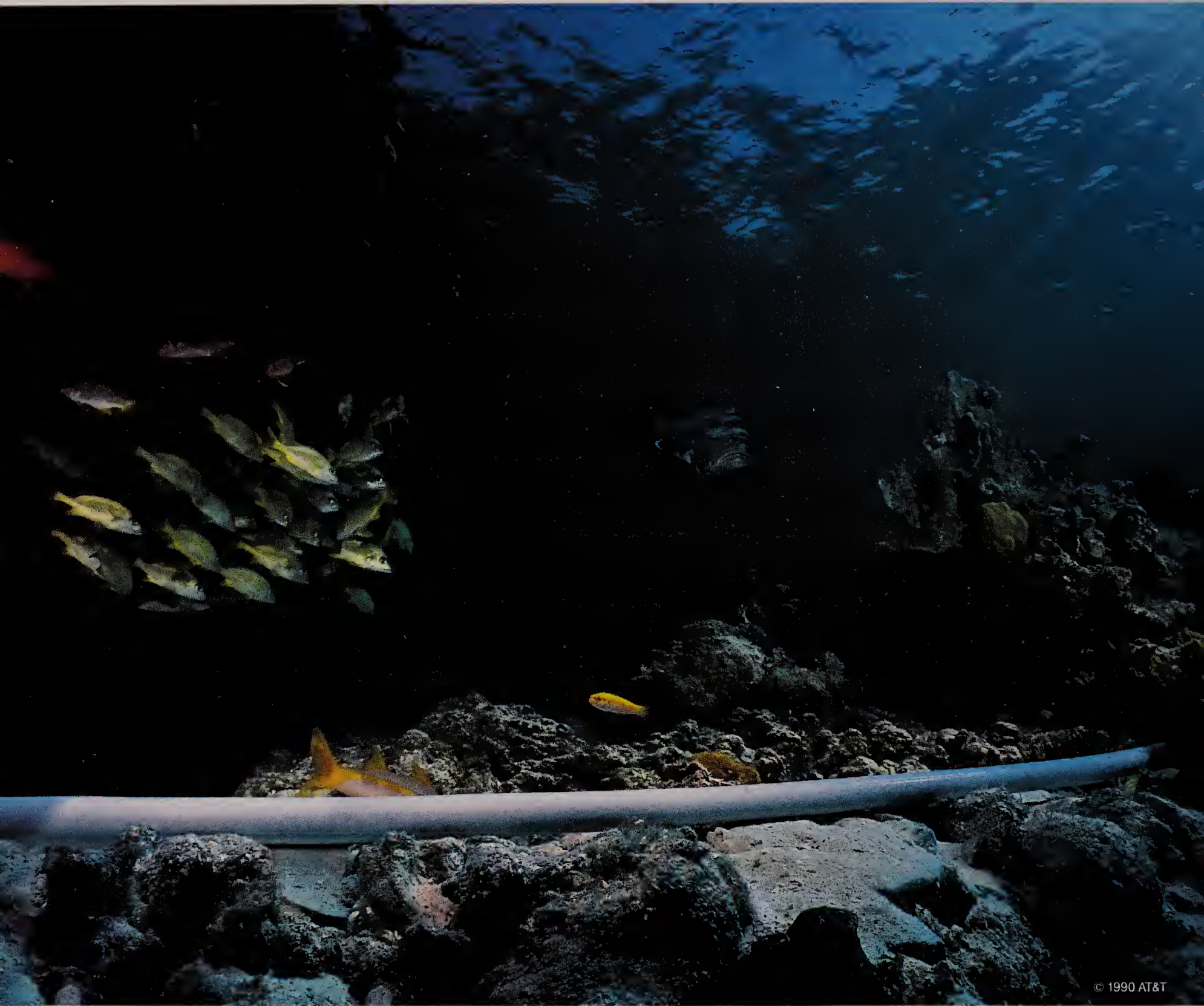


Executive Edge is a registered trademark of Execucom Systems Corporation.

Commander is a registered trademark of Camshare, Inc.

Command Center is a trademark of Pilot Executive Software.

Without AT&T, a problem down here could sink your business.



© 1990 AT&T

At AT&T, providing state of the art overseas private line service is just part of what we do. Providing state of the art back up is the rest of the job.

Our special routing options provide the ultimate in security for your private network.

For example, AT&T International ACCUNET® Digital Services offers you the option of diversity. So your back-up can be on a separate

cable, not just a separate line.

And AT&T SKYNET® International Service, our satellite network, also provides the option of physically separate routes to ensure performance.

But special routing options are just one reason to choose AT&T. Our 60 years of international experience is another. We have solid, established relationships with phone companies around the world. And AT&T representatives in 27 countries.

So before you make your next international call, call AT&T at **1 800 448-8600 ext. 333.**

You'll see why AT&T is the best company to keep your information systems afloat.



AT&T

The right choice.